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THE RELATIONSHIP BETWEEN MANIA AND FEEDING/MEALTIME BEHAVIOR
PROBLEMS AMONG PERSONS WITH INTELLECTUAL DISABILITY

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

in

The Department of Psychology

by

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ABSTRACT

This study represents the first to assess whether a relationship between mania and feeding/mealtime behavior problems exists in individuals with ID. Participants were compared across three groups (manic, non-manic psychiatrically impaired, and controls) on subscales and items of the *Screening Tool for fEeding Problems* (STEP). An attempt was made to assess for differences in problematic feeding behavior. Individuals in the manic group exhibited clinically significant symptoms of mania (n = 18), those in the non-manic psychiatrically impaired group exhibited symptoms of psychopathology other than mania (n = 18), and those in the control group did not exhibit symptoms of mania or any other psychopathology (n = 18). Significant differences were found across the groups for nutrition related behavior problems. Specifically, individuals exhibiting symptoms of mania were significantly more likely to ‘continue to eat as long as food was available’. Implications of these data are discussed.

INTRODUCTION

Mental Retardation

Historically, individuals with intellectual disability (ID) have received little in the way of money and organized efforts toward assessment and treatment for their deficits. However, the field of ID has received increasingly more attention as decades have passed. Specifically, researchers and clinicians have focused on classification issues and conceptual models of psychopathology as they relate to those with ID. More clinicians are being trained to work specifically with this population, thus increasing the number of avenues available to aid individuals with ID who have mental health service needs. To better understand the field and its growth, the definition, history, prevalence, and etiology of individuals with ID will be discussed in more detail. The first area that will be discussed is the definition of ID and how it has evolved over the years.

Definition

The definition of ID has varied over time; early classifications were based on social competence, but more objective and intellectual criteria evolved following the development of standardized intelligence tests in the early 1900's (Mathias & Nettlebeck, 1992). Substandard intellectual functioning, independent of adaptive functioning, was considered when evaluating for ID before the 1960's (Scheerenberger, 1983). However, in 1961, the *American Association on Mental Deficiency* (AAMD) included in its definition of ID the component of "associated impairment in adaptive behavior" (Heber, 1961). This new addition, although controversial, has been adopted into today's definition of ID. The current definition as stated in the *Diagnostic and Statistical Manual, Fourth Edition-Text Revision* (DSM-IV-TR; *American Psychiatric Association*, 2000) is a combination of older and newer definitions by AAMD, and includes three

criteria: (1) significantly sub-average intellectual functioning (IQ of 70 or below on standardized intelligence test); (2) concurrent deficits or impairments in present adaptive functioning; and, (3) onset before the age of 18 years. Although the classification of substandard cognitive functioning is objective and measurable (commonly defined as two standard deviations below the mean on standardized intelligence tests), critics argue the concept of adaptive behavior is much more difficult to define and measure (Zigler, Balla, & Hodapp, 1984). Despite this debate, the classification of ID currently includes the concept of adaptive behavior, and this inclusion provides information that may prove useful in placement decision-making and treatment planning.

Within the broad category of ID, there remain the same four levels proposed by the AAMD in 1961. These levels include mild, moderate, severe and profound ID. Individuals with mild ID constitute the largest segment (about 85%) of those with the disorder. Their IQ levels range anywhere from 50-55 to 70. Often, as children, individuals with mild ID are not distinguishable from children without ID until a later age. With appropriate supports, these individuals can usually live successfully in the community, either independently or in supervised settings (APA, 2000).

The next category is known as moderate ID. These individuals constitute about 10% of the entire population of individuals with ID. Their IQ levels range anywhere from 35-40 to 50-55. Differentiating these individuals from their mildly intellectually disabled counterparts is often difficult. Many of these individuals also adapt well to life in the community, usually in supervised settings (APA, 2000).

Individuals with severe ID represent the third group. These individuals constitute about 3-4% of individuals with ID. The IQ levels of these individuals range from 20-25 to 35-40.

These individuals are often easier to diagnose at an early age due to their communicative delays. Most adapt well to life in the community, in group homes or with their families, unless they have an associated handicap that requires specialized nursing or other care (APA, 2000).

The fourth group is composed of individuals with profound ID. Most of these individuals have an identified neurological condition that accounts for their ID. Additionally, many of these individuals have motor or physical impairments that impede their functioning. These individuals constitute about 1-2% of individuals with ID. The IQ levels of these individuals are below 20 or 25. The majority of these individuals live in closely supervised and sheltered settings (APA, 2000). Arriving at these diagnostic categories has been many years in the making. An overview of the history of the field follows.

History

The major area of clinical practice and research for individuals with ID began in the 1850's. The reader should not be surprised, then, that the treatment history before then was largely one of neglect. To begin with, the idea of ID was in and of itself a difficult concept to understand and accept. In ancient Greece and Rome, infanticide was a common practice when children were suspected of ID. For example, children were often thrown off the edge of cliffs when found to be "defective" (Biasini, Grupe, Huffman & Bray, 1999). In 1690, John Locke was the first to distinguish between ID and mental illness; "Herein seems to lie the difference between idiots and madmen, that madmen put wrong ideas together and reason from them, but idiots make very few or no propositions and reason scarce at all" (Doll, 1962).

Jean-Marc-Gaspard Itard and Edouard Seguin initiated the first step towards the care and treatment of those with ID in the early to mid-nineteenth century. Itard developed a broad educational program for a young child who was deaf and mute. Itard's educational approach

became widely accepted and passed down to other physicians, namely Edouard Seguin, who then developed a comprehensive approach toward the education of individuals with ID. These broad educational approaches were modified and are still in use today (Biasini et al., 1999).

The early part of the 20th century can be characterized by a mixture of advances and setbacks regarding individuals with ID. For example, the *Binet-Simon Individual Tests of Intelligence*, the first intelligence test, appeared in 1905. This version was intended to distinguish between subnormal and normal school-age children and it was interpreted in terms of the three levels of ID (Scheerenberger, 1983). In 1911, New Jersey passed the first state law requiring the mandatory special education of children with mild ID. The goal of these classes evolved from simply removing the most difficult child from the regular classroom, to making them more capable in their family life, and later in academic work and physical education. In the early part of the century, however, laws were also passed that prohibited marriage among the intellectually disabled. Sterilization was another measure pursued to prevent reproduction of those with ID (Scheerenberger, 1983). The effects of some of these laws were individuals with ID were often seen as subhuman, leading to an increase in institutionalization.

In 1924, one of the field's leaders, Fernald, delivered a speech that acknowledged no two individuals with ID were exactly alike and there was no routine procedure that would meet all the client's needs (Fernald, 1924). It was around this time special education classes began stressing an ideographic approach to assessment and treatment for individuals with differing educational needs (Baker, 1937).

In 1936, the first measure of adaptive behavior known as the *Vineland Social Maturity Scale* was developed (Doll, 1935). The rising interest in adaptive behaviors precipitated the development and funding of learning research. During the 1940's and 50's the new version of the

Stanford-Binet was introduced, providing a new classification system for the levels of ID: Borderline (IQ 67-83), Mild (IQ 50-66), Moderate (IQ 33-49), Severe (IQ 16-32), Profound (IQ 16 or below). This new terminology was introduced to avoid the negativism associated with earlier classifications. In 1961, the AAMD distributed their revised definition of ID: 'Mental retardation refers to subaverage general intellectual functioning which originates in the developmental period and is associated with impairment in adaptive behavior' (Heber, 1961). The AAMD also proposed revising the classification system by only having four classifications of ID. This classification system is used today. With the emergence of these assessment techniques in the middle of the twentieth century, clinicians believed it was possible to identify individuals with ID and to provide them with appropriate training in residential training schools (Biasini et al., 1999).

When the de-institutionalization movement began in the later half of the twentieth century and individuals with ID began living in the community, those prominent in the behavior modification movement began demonstrating that aberrant behavior among those with ID could be treated (Matson & Sevin, 1994). Treatment services gradually became available to individuals with ID and their families, and schools began placing emphasis on special programs for the developmentally delayed. This finding was significant because it implied simply being labeled with "ID" no longer suggested nothing could be done to improve that person's quality of life.

Prevalence

As is often the case with prevalence rates, there is no set percentage when it comes to the rate of individuals with ID in the general population. However, due to the fact the definition of ID has remained stable over recent years, rates of intellectually disabled individuals in the general population also continues to be fairly stable. ID is believed to occur at a rate of

approximately 1% in the general population (APA, 2000). The *1994/1995 National Health Interview Survey* (Larson, Lakin, Anderson, Kwak, Lee & Anderson, 2001) estimated the rate of ID to be .78%, the rate of developmental disabilities to be 1.13%, and the rate of combined ID and developmental disabilities to be 1.49%. However, it has been shown that when the category is divided into moderate, severe, and profound levels of ID, rates vary with the larger proportion in the moderate ranges (Bernsen, 1976; Darragh, 1982). The prevalence of ID across gender has also been investigated. The DSM-IV-TR reports a male to female ratio of 1.5:1 (APA, 2000), which is similar to that reported in other studies (e.g., Lindsey & Russell, 1981; McLaren & Bryson, 1987). The reasons for an increased rate of ID among males are not clear. Further study into the role of different variables is necessary to begin to understand the relationship between gender and ID via research on etiology (McLaren & Bryson, 1987).

Etiology

The etiology of ID is an area that has received ample attention over the course of the last few decades. Despite this, the causes of ID, in many cases, remain a mystery. However, researchers have shown that in most cases of severe and profound ID, several genetic causes exist. Some heritable forms of ID include tuberous sclerosis, fragile X syndrome, Down's syndrome, Tay-Sachs disease and phenylketonuria. Prematurity, hypoxia, birth trauma and fetal malnutrition are all examples of conditions that arise during prenatal and perinatal development as well. Prenatal factors are considered to be more common than perinatal and postnatal factors combined (McLaren & Bryson, 1987). Other conditions that occur in childhood include infection, lead poisoning and negligence. Negligence may be a contributor of ID in that a child who is not exposed to adequate communication and verbal skills during their early years of language acquisition may struggle with these skills later in life (Warren, 1992). Although the

conditions described above may be contributing causes of ID, these conditions can also co-occur to further limit the intellectual capacity of an individual. The area of dual diagnosis, a term often used to describe the co-occurrence of intellectual deficits and mental illness, has become a topic of increasing interest.

Dual Diagnosis

The term dual diagnosis has been used to account for a variety of conditions in the field of psychology (Miklowtiz, 2004). However, clinicians and researchers in the field of ID usually define dual diagnosis as the co-occurrence of mental health disorders with ID. Although the amount of research regarding dual diagnosis is growing, there remain problems in the assessment of various disorders in individuals with ID. This section will discuss the history, prevalence, etiology and assessment of dual diagnosis in the order just listed.

History

Clinicians had long assumed to be considered mentally ill, the capacity to reason and generate complex thought was required. Thus, the prevailing view for decades was ID and mental illness were mutually exclusive diagnostic entities, since many believed individuals with ID lacked such a capacity (Lewis & MacLean, 1982). As a result, aberrant behavior was often considered a direct consequence of ID, and psychiatric symptoms were frequently subsumed under the diagnosis of ID. This practice has since been termed diagnostic overshadowing and has been discussed in the literature (Lewis & McLean, 1982; Reiss, Levitan & Szyszko, 1982).

When the de-institutionalization movement began in the later half of the twentieth century and those with ID began living in the community, the concept of dual diagnosis suddenly became a reality. Institutionalized behaviors became increasingly problematic following community placement. In addition, those prominent in the behavior modification movement

began demonstrating aberrant behavior among those with ID could be treated (Matson & Sevin, 1994). This finding was significant because it implied simply being labeled “ID” no longer suggested that treatment was inappropriate for those with co-occurring psychopathology.

Considerable debate has occurred in the field over issues concerning treatment and assessment, but substantial progress has been made in providing services to individuals with a dual diagnosis. Specifically, behavioral interventions that had previously been limited in application to the general population, are now being used to treat phobias, depression, obsessive-compulsive behavior, and psychosomatic problems among those with ID (Matson & Sevin, 1994). In addition, psychopharmacological interventions are also proving to be an efficacious means of treatment for some forms of psychopathology within the dually diagnosed population. Along with the increase in treatment options for the dually diagnosed, the last 30 years have resulted in an increase in the number of assessment measures and training facilities designed specifically for these individuals. Consequently, such developments have not only aided clinicians in targeting various psychiatric disorders, but they have also expanded the field of dual diagnosis by forming more accurate prevalence estimates.

Prevalence

Epidemiological research conducted on the prevalence of psychiatric disorders among individuals with ID indicate that rates of psychopathology are much higher within this population (MacLean, 1993). Numerous studies on the prevalence of dual diagnosis have led to estimates ranging from less than 10% to greater than 80% of the population being affected (Borthwick-Duffy, 1994). Iverson and Fox (1989) found that 35.9% of their 165 adults with ID met criteria for presence of psychopathology. Another study, considered to be seminal in the field, found the prevalence estimate for the entire population of the Isle of Wight to be three to

four times higher among children with ID compared to non-disabled children (Rutter, Tizard, Yule, Graham, and Whitmore, 1976). It has also been reported that patients with ID occupy half of the inpatient mental health beds in the United States (Matson & Sevin, 1994).

Although available prevalence studies yield different results, it should be noted that prevalence estimates of psychopathology vary widely depending on the diagnostic criteria employed (Fraser, Leudar, Gray & Campbell, 1986), nature of the sample (community vs. institutional) (Jacobson, 1982; Leudar, Fraser & Jeeves, 1984; Scanlon, Arick & Krug, 1982), gender (Koller, Richardson, Katz & McLaren, 1983), age (Jacobson, 1982), level of ID (Iverson & Fox, 1989; Jacobson, 1982; Koller et al., 1983) and the manner in which the psychiatric evaluation was conducted (Iverson & Fox, 1989). In addition, the types of psychiatric disorders evident among persons with ID generally represent the full range of diagnostic classifications, but there does appear to be some difference in the prevalence of specific disorders as a function of the level of ID (Eaton & Menolascino, 1982; Jacobson, 1982; Koller et al., 1983; Lund, 1985; Phillips & Williams, 1975; Reid, 1976, 1993; Wright, 1982). The general consensus is the co-occurrence of psychopathology and ID is about four to five times more prevalent in intellectually disabled children as compared with non-disabled children (Chess & Hassibi, 1970; Eaton & Menolascino, 1982; Koller et al., 1983; Reid, 1972; Rutter, Graham & Yule, 1970).

Etiology

While it is well established that individuals with ID display a full range of psychiatric disorders at a higher prevalence rate than that of the general population (AACAP, 1999; IASSID, 2001), there remains great speculation about why this is the case. Most researchers believe clinical syndromes with similar etiologies and presentation are present in this population (IASSID, 2001), while others have investigated the possibility of unique diagnostic entities

(Einfield & Aman, 1995). Matson and Sevin (1994) described four different theories of the etiologies of dual diagnosis. The four theories are organic, behavioral, developmental, and sociocultural. They will be described in the following sections.

Organic. Organic models of psychopathology emphasize physiological, biochemical, and genetic factors as potential causes of psychopathology (Matson & Sevin, 1994). In cases of severe and profound ID, it is generally acknowledged that afflictions are associated with structural brain abnormalities (Crome & Stern, 1972). In the mild and moderate populations of ID, organic models of psychopathology may also apply.

Rutter (1971) found psychiatric disorders to be more common in intellectually disabled children with neurological abnormalities than in intellectually disabled children without such abnormalities. Donaldson and Menolascino (1977) reported associations between central nervous system (CNS) dysfunction and childhood psychosis in individuals with ID. It simply remains possible that individuals born with the certain neurological deficits may also exhibit deficits in other areas that foster and maintain psychological disorders.

Other theories accounted for by the organic model of dual diagnosis are biochemical and sensory impairment theories. The dominant biochemical theories of schizophrenia and affective disorders have been extended to the dually diagnosed. Some of these theories include the dopamine hypothesis for schizophrenia in which psychotic symptoms are attributed to overactive or hypersensitive dopaminergic systems. The effectiveness of neuroleptics (dopamine antagonists) in treating psychotic symptoms in the general population is cited as support of this theory (Matson & Sevin, 1994). Sensory impairments also frequently accompany individuals with ID (Lewis & MacLean, 1982). Although sensory impairments are not direct causes of emotional and affective disorders, there is evidence that associations do exist. For example,

Freedman and Malkin (1977) found that emotional disorders are more prevalent in the hearing impaired than in the general population. However, empirical research examining relationships between sensory problems and the dually diagnosed have not been conducted.

Behavioral. Behavioral models are used to reflect the complex interactions between the individual and his/her environment. This model is based on the premise that all behavior, including deviant behavior, is learned according to the principles of classical conditioning, social learning theory, and operant psychology (Matson & Sevin, 1994).

Classical conditioning models have been discussed primarily in relation to anxiety disorders in those with ID. These models posit that an originally neutral stimulus, present at the time of a fear response, may become a conditioned stimulus for fear. These models appear valid when extended to those with ID (Ollendick & Ollendick, 1982). Theorists also emphasize social learning aspects in the social learning model. According to these theorists, fears or phobias may be acquired when an individual observes another individual suffering anxiety in response to an object or event. This may often happen in institutional settings where one's behavior often serves as a model for another's.

Finally, Bijou (1966) outlined four possible explanations for atypical development in individuals with ID. These models can be described as operant. First, inadequate reinforcement from the environment may prevent an individual from acquiring a behavioral repertoire adequate for dealing with everyday tasks. For example, isolation and limited opportunities for socialization may contribute to affective disorders such as depression. Second, inappropriate punishment may modify adaptive behavior and increase avoidance behavior. This is particularly common for institutionalized individuals. For example, if an individual receives inappropriate punishment, they may be more likely to experience feelings of helplessness, consequently

developing depression and/or anxiety. Similarly, Hagerman and Sobesky (1989) found social anxiety appeared to be related to social failure experiences. Third, deviant response sets may develop as a result of contingent reinforcement. For example, depressive behaviors may be reinforced when they result in escape from work situations or other unpleasant events. In Mowrer's two-factor theory (Mowrer, 1939, 1960), fears or phobias are thought to be initially acquired through classical conditioning, and then maintained through operant conditioning. Fourth, abnormal anatomical structure and physiological functioning may alter stimulus or response functions, with adverse effects on the stimulus-response relationship. For example, a child with cerebral palsy, according to the nature of the disorder, will be limited in the motor responses he/she is able to perform. Consequently, he/she will be limited in their number and complexity of responses (Matson & Sevin, 1994). These four principles appear to be relevant to the etiologies of psychopathology in those with ID (Bijou, 1966; Matson & Sevin, 1994).

Developmental. Developmental models usually refer to the phenomenon that sequences of cognitive development are universal and invariant. For example, Sternlicht (1979) studied patterns of fears in institutionalized adults with ID. Fears were successfully categorized into fears of animals, supernatural or natural events, physical injury, psychological stress, and egocentric responses. Sternlicht concluded that the same developmental trend of fears that appears in normal children may also appear in people with ID, following Piaget's pattern of cognitive development (Matson & Sevin, 1994).

Sociocultural. This final theory of dual diagnosis refers to the environment as the main antecedent toward the development of various disorders. Reiss and Benson (1984) have noted many individuals with ID are exposed to an excessive number of negative social experiences. The individuals who are afflicted with mild and moderate levels of ID particularly feel

segregated from the general population. These experiences may contribute to a considerably negative psychological impact, leading one to develop certain mood disorders. Additionally, psychopathology in the general population has been linked to low socioeconomic status, poor family, and poor health status (Baumeister, 1988). These characteristics are all examples of sociocultural variables that may contribute to one's mental health.

Assessment

Given that dual diagnosis has become such a well-researched topic in the past few decades, it is no surprise that many different methods for standardized assessment have been developed. Prior to the late 70's and early 80's, assessment methods traditionally utilized with the population at large were also employed for assessment of psychopathology among individuals with ID (Mordock & Van Ornum, 1989). This approach included projective measures such as the *Thematic Apperception Test* and the *Rorschach* (Mayville and Matson, 2003). Since those with ID often possess a wide array of communication and cognitive deficits that are not as prevalent in the population at large, many of these measures were not adequate for use with these individuals. Consequently, the development of measures to screen for psychopathology specific to individuals with ID became especially important (Sovner, 1986). This section will discuss the most common ratings scales used as indirect methods to screen for psychopathology in this population, as well as methods of direct and functional assessment.

Rating Scales for Assessment of Dual Diagnosis. Standardized measures were being developed and implemented to aid in assessing dual diagnosis in persons with ID by the early 1980's. The measures that will be discussed are *The Psychopathology Instrument for Mentally Retarded Adults* (PIMRA; Senatore, Matson & Kazdin, 1985), *The Diagnostic Assessment for the Severely Handicapped* (DASH-II; Matson, 1995), *The Assessment of Dual Diagnosis* (ADD;

Matson & Bamburg, 1998), and *The Aberrant Behavior Checklist* (ABC; Aman & Singh, 1986). These measures represent four of the most frequently used devices to assess for psychopathology in this population. Additionally, the *Reiss Screen for Maladaptive Behavior* (Reiss, 1988) will be discussed as well.

The PIMRA was the first measure of psychopathology developed specifically for use in individuals with ID. The PIMRA consists of 56 items, and was developed in both self-report and interview formats that conformed to DSM-III diagnostic criteria. Evidence for criterion validity and construct validity were found for some of the subscales included on the PIMRA. The scale as a whole was found to have good reliability and validity (Linaker & Helle, 1994; Senatore, Matson & Kazdin, 1985).

Although the PIMRA represented the first step toward the development of a measure specifically to assess dual diagnosis, there remained a need for measures developed even more specifically for the different levels of ID (Matson, Gardner, Coe & Sovner, 1991). For example, an individual with mild ID may exhibit the ability to communicate verbally, while an individual with profound ID may not. This difference alone can make the need for different scales a necessity, since it speaks to the contextual nature of the items. Consequently, Matson and colleagues (1991) developed the first diagnostic measure specifically designed for use with those in the severe to profound range of ID. The DASH was developed to assess the frequency and severity of symptoms representative of a wide array of diagnostic entities. The DASH was originally keyed to DSM-III-R diagnostic criteria and has subsequently been revised to correspond to the diagnostic criteria in the DSM-IV (DASH-II; Matson, 1995). The DASH-II is an informant-based scale that consists of 84 items that make up 13 subscales representing various diagnostic categories. This scale is used primarily for screening purposes. Matson (1995) found

good initial estimates of inter-rater reliability across psychiatric conditions represented on the DASH-II.

Like the DASH-II, the *Assessment of Dual Diagnosis* (ADD) was developed to screen for psychopathology, but only for those diagnosed with mild and moderate ID. The ADD is a 79-item informant-based measure based on DSM-IV criteria. It consists of 13 subscales: 1) Mania, 2) Depression, 3) Anxiety, 4) Posttraumatic Stress Disorder, 5) Substance Abuse, 6) Somatoform Disorders, 7) Dementia, 8) Conduct Disorder, 9) Pervasive Developmental Disorder, 10) Schizophrenia, 11) Personality Disorders, 12) Eating Disorders & 13) Sexual Disorders. The ADD assesses the frequency, duration, and severity of each symptom reported as present over the last month. Matson and Bamburg (1998) reported good to excellent test-retest reliability, internal consistency, and inter-rater reliability across all subscales of the ADD.

The *Aberrant Behavior Checklist* (ABC) is another measure developed for the assessment of various maladaptive behaviors among those in the severe to profound range of ID. The ABC consists of 58 items derived with the specific purpose of assessing treatment effects (i.e., behavioral intervention or medication) on behavior (Aman, 1991). The ABC is unlike the DASH-II in that it is a statistically derived measure as opposed to a rationally derived one. The five subscales of the ABC identified through factor analysis are: 1) Irritability, 2) Agitation, 3) Stereotypic Behavior, 4) Hyperactivity, and 5) Inappropriate Speech. Internal consistency, test-retest reliability, and inter-rater reliability have all been found acceptable (Aman, 1991).

The final scale to be discussed is the *Reiss Screen for Maladaptive Behavior* (Reiss, 1988). The *Reiss Screen for Maladaptive Behavior* was designed to assess the likelihood that adolescents or adults with ID may have a mental health problem. This instrument is a 38-item informant based rating scale scored on a scale ranging from 0 (no problem) to 2 (major problem).

A factor analysis yielded seven factors: 1) aggressive behavior, 2) psychosis, 3) paranoia, 4) depression (behavioral signs), 5) depression (physical signs), 6) dependent personality disorder, and 7) avoidant disorder. The *Reiss Screen for Maladaptive Behavior* is different from other scales that screen for psychopathology in that the items correspond to behavioral dimensions rather than individual behaviors. Aman (1991) reported the *Reiss Screen for Maladaptive Behavior* may be most useful for identifying psychopathology in general, as opposed to serving as a screener for individual diagnoses based on DSM criteria. Although Reiss (1988) reported some evidence of criterion validity and reliability for the *Reiss Screen for Maladaptive Behavior*, Sturmey and Bertman (1994) suggest the subscales of the *Reiss Screen for Maladaptive Behavior* may lack construct validity. Although these rating scales clearly offer important information toward the assessment of dual diagnosis, there are other methods of assessment essential toward a global assessment.

Direct and Functional Assessment

Direct methods of assessment usually involve observing the target behavior, or its precursors, which may then give rise to the function of the behavior. Careful observation of the stimuli to which the client approaches or avoids, and observation of stimuli staff are reluctant to present may give valuable clues as to the function of the target behavior (Sturmey & Bernstein, in press). Direct observation, descriptive assessments, analogue functional analyses, as well as functional assessment rating scales will be described in this section.

Direct Observation. Observation methods play a crucial part in the assessment of psychopathology in individuals with ID. Operationally defining the behavior is one of the most important steps in a direct observation. For example, if one is assessing an individual for depression, one may want to identify sleep patterns, eating behaviors, and mood (i.e., positive

and negative affect) as the target behaviors to be observed (Rush, Bowman, Eidman & Toole, in press). An important step in observing behaviors is to establish the rates of the behaviors. Low frequency behaviors, in particular, may not be seen during sessions, especially when the frequency is equal to or lower than once per day. High frequency behaviors, on the other hand, may be assessed in short observation periods. It is also important to identify an observation schedule (continuous or sampling). A continuous schedule is one in which data is recorded throughout the day, with no interruptions. Outside of a residential facility however, this type of observation schedule may be unrealistic. And given the poor staff-to-patient ratio within many institutions, this type of observation schedule may be too difficult to carry out consistently. Most often, a sampling schedule (where the target behavior is observed during a predefined time period or event period) is used (Rush et al, in press). Some observation methods are more time consuming and costly than others, but some of the more time consuming methods also provide richer information than others.

Descriptive Assessments. Descriptive assessments are based on direct observations in the natural environment. For example, a scatterplot analysis (Touchette, McDonald & Langer, 1985) permits comparison of the occurrence of a problem behavior with the time of day and activity variables. Each occurrence of the target behavior is plotted on a grid with the time of day on the ordinate and consecutive days on the abscissa. Upon examination of the grid, patterns of behavior may be identified. In addition, there is the *Antecedent-Behavior-Consequence Assessment* (ABC; Bijou, Peterson & Ault, 1968) that requires each episode of the problem behavior and the environmental events that precede and follow the behavior be recorded. An ABC assessment is particularly useful when examining low frequency behaviors and behavior that occurs in bursts (Bijou et al., 1968). Although descriptive assessments can be time

consuming, the data can be very rich in content given that it's observed directly and in the natural environment. However, when direct observation of aberrant behavior is not possible, analogue functional analysis may provide useful information (Singh, Sood, Sonenklar & Ellis, 1991).

Analogue Functional Analysis. Analogue functional analysis is the most time consuming method for determining consequences maintaining problem behaviors. The basis of this assessment is the experimental manipulation of specific variables in controlled settings. For example, during an analogue functional analysis session for attention, an experimenter presents a series of tasks to the client; 30 seconds of attention is then provided, contingent on the problem behavior. A control condition would also be presented. The idea would be to see if attention is reinforcing or maintaining the problem behavior. This methodology generally has been demonstrated to be highly effective in identifying variables maintaining problem behavior and in facilitating treatment selection (Iwata et al., 1994). However, this form of assessment is very time consuming and costly. In addition, when behaviors are of high intensity (i.e. risk of injury), an analogue functional analysis may not be ethically appropriate as the individual is exposed to conditions that may increase the frequency of the behavior (Sturmey, 1995; Vollmer & Smith, 1996). Although the benefits of conducting analogue functional analyses generally outweigh the disadvantages, many of the limitations could be circumvented if brief yet valid functional assessments could be identified (Vollmer, Iwata, Zarcone, Smith & Mazaleski, 1993; Yarbrough & Carr, 2000). These concerns have led to the development of functional assessment rating scales. Two functional assessment scales are described next: the *Motivation Assessment Scale* (MAS; Durand & Crimmins, 1988), and the *Questions About Behavioral Function* (QABF; Paclawskyj, Matson, Rush, Smalls & Vollmer, 2000).

Functional Assessment Rating Scales. Until recently, the MAS had been the most extensively evaluated psychometric measure for functional assessment (Sturmey, 1994). The MAS is a 16-item questionnaire that addresses four subscales: attention, escape, tangibles, and sensory consequences. Initial psychometric properties seemed to be strong, however, later studies failed to replicate the robustness of the MAS (Sturmey, 1994). Sturmey (1994) reported inter-rater reliability for the MAS ranged from .25 to .70 and the internal consistency of the scales proved to be poor. Due to the abundance of problems associated with the psychometric properties of the MAS, its use should be regarded with some caution (Spreat & Connelly, 1996; Sturmey, 1994). The QABF, which is of much more recent origin, has shown consistent results on reliability and validity tests and seems more promising (Matson, Bamburg, Cherry & Paclawskyj, 1999; Paclawskyj et al., 2000).

The QABF is a 25-item informant based rating scale designed to address known potential behavioral functions, identified from a review of previous literature. The QABF is based on a 4-point Likert scale and the items are centered on five possible functions: attention, escape, non-social, physical, and tangible. Recently researchers have shown the QABF is a reliable tool, in terms of test-retest and inter-rater reliability (Paclawskyj et al., 2000). Consequently, the knowledge gained from the administration of the QABF can be used to aid in the development of a behavioral treatment plan that specifically targets the functions of the maladaptive behaviors, thereby decreasing the behaviors themselves.

All of the methods described above have been valuable in improving the accuracy of the assessment process for individuals with a dual diagnosis. The next area of this paper will focus more specifically on bipolar disorder and mania in the general population, as well as in those with ID.

Bipolar Disorder

Bipolar disorder, formerly known as manic-depressive disorder, has been researched and written about by countless scholars in the field of psychology. The hallmark feature of bipolar disorder is often thought to be the swinging back and forth between two different states of moods, and this fluctuation can make for a very interesting disorder. However, the term bipolar disorder is actually more complex than simply an alteration in moods. In fact, bipolar disorder includes various subtypes, many of which are unknown to the general public. This section will explore the following areas of bipolar disorder as it applies to the general population: history, definition, prevalence, etiology, assessment and treatment.

History

The origin of the concept of bipolar disorders has its roots in the works and views of the Greek physicians of the classical period (Angst & Marneros, 2001). One of the first people to describe mania and melancholia as two different phenomenological states of one and the same disease was the Greek physician of the 1st century AD, Aretaeus of Cappadocia. Essentially, Aretaeus viewed melancholia and mania as having the same etiology, namely disturbances of the function of the brain and some other organs. However, Aretaeus also viewed mania as a worsening of melancholia, and his concepts of these two states were broader than modern concepts. Although Aretaeus described these two states of mood in some detail, Hippocrates was the first who described them systematically (Angst & Marneros, 2001). Specifically, Hippocrates based his theories on the views of other scholars such as Alcmaeon and Empedocles of Crotona. These scholars theorized the origin of diseases was the disturbed interaction of body fluids with the brain. Hippocrates also assumed the brain as the organ of mental functions, mental disturbances and mental disorders (Angst & Marnero, 2001). However, Hippocrates also pointed

out the impact of the social and topographical environment, as well as the significance of a strong relationship between physician and patient (Marneros, 2001).

Another philosopher named Plato based many of his theories in mythology. For example, Plato declared there were two kinds of mania, one involving a mental strain that arises from a bodily cause of origin, the other divine or inspired, with Apollo as the source of inspiration. Plato went on to explain another kind of divine mania is sent by Father Bacchus, and still another, called “erotic inspiration”, is sent by the god of love (Angst & Marneros, 2001).

These early philosophers and theorists helped bring about the modern idea of bipolar disorder, but in the 19th century, a man named Jean-Pierre Falret described a separate disease he called “folie circulaire”, characterized by a continuous cycle of depression and mania. This theory held the interval between the manic and melancholic episodes was important, and even episodes of mania and melancholia separated by a long interval still belonged together. However, around the same time, Jules Baillarger proposed a different idea he called “folie a double forme”. He assumed this was a type of disease in which mania and melancholia change into one another, but the interval was of no importance (Pichot, 1995). Both of these theories found acceptance and worldwide acclaim for years to come.

Also in the 19th century, a man by the name of Emil Kraepelin contributed enormous amounts of knowledge to the understanding, diagnosis and prognosis of manic-depressive disorder. Kraepelin’s classification systems were fundamental building blocks in all facets of mental healthy nosology. After much debate and years of stagnation in the progress of research on characteristics of the manic-depressive illness, it was finally recognized there was a distinction between unipolar and bipolar disorders. This came in 1966 with the emergence of two hallmark publications, both of which independently supported the nosological differentiation

between unipolar and bipolar disorders (Akiskal, 1981). This theory has been widely accepted by today's clinicians and researchers.

Another debate concerning bipolar disorder is the concept of a continuum of manic conditions, better described as a bipolar spectrum. Klerman (1981) distinguished six subtypes of bipolar disorders: mania, hypomania, hypomania or mania precipitated by drugs, cyclothymic personality, depression with a family history of bipolar disorder, and mania without depression. Other researchers have provided evidence, based on clinical observation and knowledge of the classical literature, for the desirability of enlarging the continuum to encompass several diagnostic subgroups, including what he terms the "soft" bipolar spectrum (Akiskal, 1996). Although some have adopted the idea of a bipolar spectrum, one of the most serious problems surrounding its acceptance is family studies do not fully support it (Coryell, 1999). Thus, as proposed by Akiskal (1996), the spectrum concept refers to a clinical, rather than a genetic spectrum.

Clearly, with the history of bipolar disorder spawning from such broad theories, it is not surprising the classification of this disorder is still debated to some degree. Similarly, defining bipolar disorder and its various subgroups is a challenge for many clinicians. The next section will discuss the definition of bipolar disorder, and will describe the different subgroups of this disorder in more detail.

Definition

Diagnostic errors are common with bipolar disorder (Johnson, 2004). One survey suggested, on average, bipolar disorder was not diagnosed for as much as 8 years after onset (Lish, Dime-Meenan, Whybrow, Price & Hirschfeld, 1994). Ghaemi, Boiman and Goodwin (2000) also found approximately 40% of persons with bipolar disorder are misdiagnosed with

unipolar disorder. One of the reasons for this is that clinicians often fail to look for signs of mania in these individuals. This section will go over the diagnostic criteria for bipolar disorder in more detail. Specifically, bipolar I, bipolar II, cyclothymic disorder and bipolar not otherwise specified (NOS) will be discussed.

Bipolar I Disorder. The essential feature of bipolar I disorder is a clinical course characterized by the occurrence of one or more Manic or Mixed Episodes (APA, 2000). Despite the name “bipolar disorder,” depression is not a diagnostic criterion. The symptoms of mania can vary a great deal from person to person (Johnson, 2004). Although mania is often characterized by symptoms of euphoria, it is important to note the cardinal mood symptoms can include either euphoria and expansiveness or anger and irritability (Johnson, 2004). Although having had a manic episode is the hallmark feature of bipolar I disorder, there are various subtypes of bipolar I disorder. These subtypes are usually named by the most recent episode (e.g., most recent episode manic).

According to the DSM-IV-TR, the specific criteria that composes a manic episode are: (1) a distinct period of abnormally and persistently elevated, expansive, or irritable mood, lasting at least 1 week (or any duration if hospitalization is necessary); (2) three or more of the following symptoms: inflated self-esteem or grandiosity, a decreased need for sleep, being more talkative than usual, a flight of ideas or subjective experience of racing thoughts, distractibility, an increase in goal-directed activity or psychomotor agitation, and excessive involvement in pleasurable activities that have a high potential for painful consequences; (3) the symptoms do not meet criteria for a mixed episode; (4) the mood disturbance is sufficiently severe to cause marked impairment in occupational functioning or in usual social activities or relationships with others, or to necessitate hospitalization to prevent harm to self or others, or there are psychotic

features; and, (5) the symptoms are not due to the direct physiological effects of a substance or a general medical condition.

Bipolar II Disorder. Bipolar II disorder is characterized by the presence of one or more Major Depressive Episodes accompanied by the presence of at least one Hypomanic Episode (APA, 2000). Individuals with bipolar II disorder may not view the Hypomanic Episodes as pathological, although others may be troubled by the individual's erratic behavior. Consequently, information from other informants is often critical in establishing the diagnosis of bipolar II disorder.

According to the DSM-IV-TR, the specific criteria that composes a hypomanic episode are: (1) a distinct period of persistently elevated, expansive, or irritable mood, lasting throughout at least 4 days, that is clearly different from the usual non-depressed mood; (2) three or more of the following symptoms: inflated self-esteem or grandiosity, a decreased need for sleep, being more talkative than usual, a flight of ideas or subjective experience of racing thoughts, distractibility, an increase in goal-directed activity or psychomotor agitation, and excessive involvement in pleasurable activities that have a high potential for painful consequences; (3) the episode is associated with an unequivocal change in functioning uncharacteristic of the person when not symptomatic; (4) the disturbance in mood and the change in functioning are observable by others; (5) the episode is not severe enough to cause marked impairment in social or occupational functioning, or to necessitate hospitalization, and there are no psychotic features; and, (6) the symptoms are not due to the direct physiological effects of a substance.

Cyclothymic Disorder. The essential feature of cyclothymic disorder is a chronic, fluctuating mood disturbance involving numerous periods of hypomanic symptoms and numerous periods of depressive symptoms (APA, 2000). The hypomanic symptoms are of

insufficient number, severity, pervasiveness, or duration to meet full criteria for a Manic Episode, and the depressive symptoms are of insufficient number, severity, pervasiveness, or duration to meet full criteria for a Major Depressive Episode.

According to the DSM-IV-TR, the specific criteria that composes cyclothymic disorder are: (1) for at least 2 years, the presence of numerous periods with hypomanic symptoms and numerous periods with depressive symptoms that do not meet criteria for a Major Depressive Episode; (2) during the 2 year period (1 year in children and adolescents), the person has not been without the symptoms in the first criterion for more than 2 months at a time; (3) there has been no major depressive episode, manic episode, or mixed episode during the first 2 years of the disturbance; (4) the symptoms in the first criterion are not better accounted for by schizoaffective disorder and are not superimposed on schizophrenia, schizophreniform disorder, delusional disorder, or psychotic disorder not otherwise specified; (5) the symptoms are not due to the direct physiological effects of a substance or a general medical condition; and, (6) the symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.

Bipolar Disorder NOS. The bipolar NOS category includes disorders with bipolar features that do not meet criteria for any specific bipolar disorder. An example of this may be if the informant is unable to specify the duration of the symptoms, and therefore the clinician is unable to differentiate between different subtypes of bipolar disorder.

While the numerous subtypes that comprise bipolar disorder may seem somewhat clear on paper, deciphering these subtypes from each other in the actual clinical setting often pose as complex challenges for clinicians. In turn, these challenges can affect the accuracy of the prevalence estimates of bipolar disorder in this population.

Prevalence

Since the introduction in 1980 of the *American Psychiatric Association's Diagnostic and Statistical Manual* DSM-III, lifetime prevalence rates for bipolar I disorder (mania) have been remarkably consistent. Specifically, the prevalence rates for bipolar I disorder have varied between 0.0 and 1.7% (Angst, 1998). Low lifetime prevalence rates were also found in 11 studies conducted on bipolar II disorders (hypomania), and these rates varied between 0.5 and 1.9%, with one outlier at 3.0% (Angst, 1998).

More recent studies on bipolarity have reported the lifetime prevalence of the bipolar spectrum is at least 5% (Akiskal, Bourgeois, Angst, Post, Moller & Hirschfeld, 2000). However, Thomas (2004) suggested this increase compared to the classical figure of about 1% is largely due to the recognition of hypomanic periods as short as 2 days interspersed with recurrent depression, as well as depressions arising from a cyclothymic temperament. Although prevalence rates of bipolar disorder do appear to be stable, it is important to recognize the misdiagnosis of this disorder does occur. As stated earlier, Ghaemi and colleagues (2000) found approximately 40% of persons with bipolar disorder are misdiagnosed with unipolar disorder.

Etiology

Researchers and clinicians have proposed a convincing argument for the genetic basis of the bipolar spectrum. In fact, heritability has been estimated to be as high as 80% (Vehmanen, Kaprio & Loennqvist, 1995). The familial nature of bipolar disorders is apparent to the observing clinician in that most patients have family histories of mood disorders (Kelsoe, 2003). For example, Gershon and colleagues (1982) suggested several features of this familial phenomenon: (1) Mood disorders occur at a higher rate in the families of bipolar patients; and, (2) it is not only bipolar disorder that occurs in these families, but a variety of mood syndromes and symptoms

that differ both qualitatively and quantitatively from bipolar disorder itself. Akiskal (2002) posits these observations of the variety of mood symptoms in bipolar families have played a prominent role in inspiring theories about the relatedness of these “spectrum” phenomena and the possible familial genetic basis for the spectrum.

Kelsoe (2003) also cites numerous family studies in which the genetic correlates for bipolar disorder appear clear. These studies consist of systematically identifying bipolar probands and determining what portion of first degree relatives are also ill. These studies also include a wide range of samples and methodologies, and generally employ a narrow definition of bipolar disorder (Kelsoe, 2003). A meta-analysis of these studies shows approximately 7% of the first-degree relatives of individuals with bipolar disorder also have the disorder. Because the classic prevalence estimate for this disorder in the general population is about 1% (Thomas, 2004), this indicates a sevenfold increase in risk. However, Kelsoe (2003) states although these studies do point out a familial association, this does not mean the etiology of bipolar disorder is purely genetic. Families often cohabitate and share the same environment and therefore, it is possible the similar environment may be the underlying etiology of this disorder. However, twin studies have been used to support the genetic etiology rather than the environmental. For example, Kelsoe (2003) selected four twin studies that found approximately 70% of monozygotic pairs are concordant for illnesses, while only about 30% of dizygotic twin pairs are concordant. Given that all sets of twins in these studies have been raised in the same environment, these data supports the idea that sharing all genes as opposed to half of the genes increases the risk for the illness over twofold (Kelsoe, 2003). Additionally, adoption studies are in general support of the twin studies, and have found an elevated rate of illness in the biological

parents, but only a population rate in the adoptive parents (Wender, Kety, Rosenthal, Schulsinger, Ortmann & Lunde, 1986).

Although the majority of studies argue for a primarily genetic basis for bipolar disorder, there is substantial evidence that psychosocial variables predict the course of the disorder. For example, expressed emotion (EE), defined as emotionally intrusive or hostile comments from family members toward individuals with the disorder, was one of the first environmental variables shown to influence the course of bipolar disorder (Miklowitz, Goldstein, Neuchterlein, Snyder & Mintz, 1988). Similarly, an absence of emotional support has been related to a poorer course of the disorder, including more frequent relapse and less successful lithium treatment (Johnson, Meyer, Winett & Small, 2000).

Another well-researched psychosocial variable known to affect the course of bipolar disorder is a negative life event. Events that are particularly high in stress are more likely to increase the time to recovery from episodes (Johnson & Miller, 1997). Finally, one study found sociotropy, a personality trait involving excessive need for reassurance and sensitivity to interpersonal life events, predicted increases in symptom severity over time in persons with bipolar disorder (Hammen, Ellicott & Gitlin, 1992). These few studies, then, suggest personality disorders and maladaptive traits contribute to poor outcomes for those with bipolar disorder (Johnson & Meyer, 2004). The next section will discuss methods of assessment of bipolar disorder, an area of research that has grown exponentially in the past ten years.

Assessment

The assessment of bipolar disorder has clearly been studied a great deal given the wide variety of rating scales and checklists that have been developed over the past decade. There are a number of personality inventories and checklists that contain mania and depression subscales as

part of an overall battery (e.g., *Minnesota Multiphasic Personality Inventory, Individual Mood and Behavior Checklist*), but this section will focus only on the most widely used measures to assess the presence and severity of acute mania in the general population. Specifically, these measures will include the *Young Mania Rating Scale* (YMRS; Young, Biggs & Meyer, 1978), the *Bech-Rafaelsen Mania Scale* (BRMS; Bech, Rafaelsen, Kramp & Bolwig, 1978), the *Manchester Nurse Rating Scale for Mania* (MNRS-M; Brierley, Szabadi, Rix & Bradshaw, 1988) and the *Self-Report Manic Inventory* (SRMI; Shugar, Schertzer, Toner & di Gasbarro, 1992).

The Young Mania Rating Scale (YMRS). The YMRS has been used extensively for assessing treatment response, especially in clinical trial studies, and is considered the gold standard by scale developers, who use it for evaluating concurrent validity with newer scales (Altman, 2004). The YMRS is an 11-item rating scale for mania in the general population. This scale is scored by the interviewer, based on subjective reports by the patient and on behavioral observations by the rater made during the interview. The items rated include elevated mood, increased motor activity, sexual interest, sleep disturbance, irritability, speech, language/thought disorder, aggressive behavior, appearance, and insight. The theoretical maximum score an individual can make on the YMRS is 60 and the minimum is 0. Although the YMRS is usually used as an outcome measure in most studies, it is also used as a diagnostic tool to help identify individuals with elevated symptoms of mania.

The Bech-Rafaelsen Mania Scale (BRMS). Another widely used rating scale is the BRMS. The BRMS is a clinician-rated mania scale that consists of 11 items, each of which is rated from 0 (normal) to 4 (extreme). Inter-rater reliability coefficients range from .80 to .95

(Bech, Bolwig, Kramp & Rafaelsen, 1979). Bech (2002) has documented the effectiveness of the BRMS as an outcome measure in numerous clinical trials over the past 20 years.

The Manchester Nurse Rating Scale for Mania (MNRS-M). The MNRS-M is a more recent and improved nurses' rating scale that was modified from the Manic-State Rating Scale (MSRS) (Beigel, Murphy & Bunney, 1971). This scale is suitable for the daily monitoring of affective states and consists of nine items rated from 0 (not present) to 3 (usually present). The MNRS-M is completed by nursing staff after observing behavior over a typical shift; it does not require the specialized training needed to administer the MSRS. Concurrent validity with the YMRS has been proven, and this scale continues to be used often in clinical settings.

The Self-Report Manic Inventory (SRMI). The relative paucity of self-report mania scales may reflect an assumption that manic patients are unreliable informants due to their euphoric mood state (Platmann, Plutchik, Fieve & Lawlor, 1969); however, the SRMI has been shown to reliably detect the presence of mania, and thus to refute the notion that manic patients are unreliable self-raters (Shugar et al., 1992). The SRMI was previously validated as a screening tool for mania, and the authors also suggested establishing the validity of the scale as a measurement of the severity of manic states. The scale comprises 47 statements describing behaviors commonly found in manic/hypomanic episodes. Participants answer "true" or "false" to each item depending on whether or not these symptoms have been more prominent during the evaluation period than during normal periods, e.g.: "I slept fewer hours than usual" (Cooke, Krüger & Shugar, 1996).

There are many mania rating scales and checklists that exist (e.g., *Altman Self-Rating Scale for Mania*, *Manic-State Rating Scale*), but the ones mentioned above are some of the most commonly used by clinicians and researchers today. These scales not only aid practitioners in

accurately assessing symptoms of mania, but also in providing precise outcome measures to guide treatment.

Treatment

The treatment of bipolar disorder has changed a great deal in the past decades. For example, whereas lithium, conventional antipsychotics, monoamine oxidase inhibitors (MAOIs), and tricyclic antidepressants represented the gold standards in treatment from the early 70s until the late 80s, the range of medication has expanded greatly (Goldberg, 2004). Although there is certainly a rich history behind the forms of treatment used today, the following section will focus only on the current treatments used for individuals with bipolar disorder in the general population. Additionally, due to the limited scope of the present study, the methods used most often for the treatment of mania, and not for the treatment of bipolar depression, will be discussed. Specifically, pharmacological, psychosocial and other treatments will be reviewed in the next section.

Pharmacological Therapy. There are numerous pharmacotherapies that have elicited anti-manic responses in individuals with bipolar disorder. For example, one drug that remains a cornerstone for both the short and long-term treatment of bipolar disorder is lithium. Lithium still remains the most extensively studied agent for relapse prevention in bipolar disorder (Goldberg, 2004). However, due to the vast number of side effects associated with lithium use, physicians often suggest using lower dosages of this drug alongside another medication. For example, combined treatment with lithium and an antipsychotic is the most common treatment for acute mania (Chou et al., 1999). The usual goal of such a combination is to produce an immediate response with the antipsychotic while intending to use the lithium adjunct as the primary drug for maintenance. Chou and colleagues (1999) found that lithium added to a low dose of haloperidol

produced a markedly greater clinical response than did the low dose alone. Similarly, a 6-week double-blind, randomized, placebo-controlled trial was conducted to determine the efficacy of combined therapy with olanzapine and either valproate or lithium, compared with valproate or lithium alone in the treatment of acute manic episodes (Tohen et al., 2002). They found compared with the use of valproate or lithium alone, the addition of olanzapine provided superior efficacy in the treatment of manic and mixed bipolar episodes.

Another class of drugs used often in the treatment of acute mania are anticonvulsant drugs. Divalproex is one of the most common anticonvulsants used to treat mania. Augmentation of divalproex with an atypical antipsychotic such as olanzapine (Tohen et al. 2002), risperidone (Sachs, Grossman, Ghaemi, Okamoto & Bowden, 2002), or quetiapine (DelBello, Schwiers, Rosenberg & Strakowski, 2002) may enhance anti-manic efficacy.

Other anticonvulsants such as carbamazepine, lamotrigine and gabapentin are also used often in the treatment of acute manic symptoms. Researchers have shown although lamotrigine has been found to have minimal acute anti-manic effects, it is still superior to gabapentin (Frye et al., 2000) in reducing symptoms of mania. However, both of these medications have shown to enhance results when used in conjunction with other medications. Also, the relatively benign side-effect profile and ease of administration may account for their popularity among prescribers (Goldberg, 2004).

As noted earlier, antipsychotic medications have been used to treat bipolar disorder for decades. However, unlike the typical antipsychotics of the past, a newer generation of antipsychotics have been developed. These are known as atypical antipsychotics and they include olanzapine, risperidone, quetiapine, and aripiprazole, among others. Olanzapine presently represents the only atypical antipsychotic drug approved by the Food and Drug

Administration (FDA) for the treatment of acute mania. Its efficacy was demonstrated in two placebo-controlled trials (Tohen et al., 2002; Tohen et al., 2000), with robust effects on mixed states (Tohen et al., 2000), rapid cycling (Gonzalez-Pinto et al., 2002), and prior non-response to lithium or divalproex (Baker, Goldberg, Tohen, Milton, Stauffer & Schuh, 2002).

There have been some studies done on some of the other atypical antipsychotics and their efficacy with manic patients. For example, Sachs and colleagues (2002) assessed the efficacy and safety of risperidone as an adjunctive agent to mood stabilizers in the treatment of acute mania. Specifically, they compared the combination of a mood stabilizer and risperidone with the combination of a mood stabilizer and haloperidol, using a double-blind, placebo-controlled design. They also looked at the effects of using a mood stabilizer alone. Risperidone plus a mood stabilizer was more efficacious than a mood stabilizer alone, and as efficacious as haloperidol plus a mood stabilizer, for the rapid control of manic symptoms.

Although pharmacotherapy undoubtedly has a place in the treatment of mania, other forms of treatment also exist. Psychologists often encourage clients to seek different forms of treatment other than medication alone, because safety and tolerability are usually not issues clients have to deal with when participating in psychosocial therapy. This will be discussed next.

Psychosocial Therapy. There are a variety of psychosocial therapies used in the treatment of bipolar symptoms, but some are used more often than others. Additionally, some psychosocial therapies are used in conjunction with medications to stabilize the patient. The psychosocial therapies that will be discussed next are cognitive therapy, interpersonal and social rhythm therapy and family therapy.

The cognitive model of bipolar disorder focuses on the individual's phenomenological experience during the depressed and manic phases (Leahy, 1999), with considerable empirical

support for the model of depression (Clark, Beck & Alford, 1999). Researchers who support the cognitive model posit the physiological predisposition for bipolar disorder interacts with life events and coping abilities that are moderated by cognitive “styles” that confer vulnerability (Leahy, 2004). The purpose of cognitive therapy then, is to challenge the content and structure of the automatic thoughts and maladaptive assumptions that characterize the depressed or manic phase (Leahy & Beck, 1988).

There are systematic ways to placate an individual’s distorted manic thinking. For example, during the calmer phase, the therapist can examine the patient’s idiosyncratic symptoms of mania. Together, the therapist and patient can weigh the costs and benefits of acting out manic impulses. These rationalizing perspectives can be recorded and reviewed daily by the patient (Leahy, 2004). This technique is known as a self-control method for mania. It involves a patient learning to self-monitor for signs of mania and reminding themselves of the consequence of their possible actions. Additionally, active role-plays can be used to practice situations that may occur in real life. For example, a therapist may alternate between enacting the tempting distortions of mania and then the tempering rational response. Often, the therapist can play one role and the patient can play the other. Thus, the patient may be able to see the consequences that may occur if the therapist were to give into the flawed rationale so often displayed in those with a manic impulse.

Interpersonal and Social Rhythm Therapy (IPSRT) is one of the first systematic psychological therapies developed specifically for individuals with bipolar disorder. Components of IPSRT include: psychoeducation, in which education is provided regarding the patient’s illness, and various treatment options; social rhythm therapy, in which routines are regularly monitored and social interactions are discussed; and interpersonal psychotherapy, in which mood

changes are linked to interpersonal and social problems (Frank & Schwartz, 2004). Frank and colleagues (1999) found IPSRT increased the stability of social rhythms in patients, but was more effective for depression than for mania, with a trend toward shorter time to recovery in depression.

Another form of therapy is known as family-focused therapy (FFT). FFT is a 9 month, 21 session outpatient program consisting of five consecutive modules: assessment of the family; education about bipolar disorder; communication-enhancement training; problem-solving skills training; and termination (Miklowitz, 2004). The goals of FFT are to assist patients and their relatives to (1) make sense of the current episodes of illness and its precipitants; (2) recognize and plan for the likelihood the illness will recur; (3) accept the need for an ongoing program of medication to maintain stability; (4) distinguish the disorder from the patient's pre-morbid personality; (5) learn to cope with stressors that provoke episodes of illness; and, (6) maximize the functionality of family or marital relationships in the aftermath of an illness episode (Miklowitz, 2004). FFT has received support in one open trial and two randomized trials (e.g., Miklowitz & Goldstein, 1990; Simoneau, Miklowitz, Richards, Saleem & George, 1999).

Although the previously mentioned psychosocial therapies have been shown to work, they are often used in conjunction with pharmacological therapies. In the next and final section, other treatments such as electroconvulsive therapy and magnetic stimulation will be discussed.

Other Treatments. Electroconvulsive therapy (ECT) has been used extensively in the general population in the management of manic states. In fact, at one time mania was the third most common indication for ECT in the United States (APA, 1978). ECT involves passing a small electric current across part of the head, causing the brain to have a seizure. While no one knows exactly why it works, symptoms of mania have been proven to decrease after treatments

of ECT. For example, Small and colleagues (1988) randomized 34 hospitalized manic patients with either lithium carbonate or an average series of nine bilateral ECTs, followed by maintenance with lithium carbonate. Ratings by non-blind and blind observers indicated the patients who underwent ECT improved more during the first eight weeks than did patients who were treated with lithium carbonate. This was especially true of patients with mixed symptoms of mania and depression and/or extreme manic behavior. However, clinical ratings after eight weeks showed comparable rates of relapse, recurrence, and re-hospitalization. Due to the invasiveness of the actual procedure, clinicians often recommend using ECT as a last resort to manage manic symptoms for the short term.

Another procedure for bipolar mania is known as a transcranial magnetic stimulation procedure (TMS). TMS is a procedure in which certain areas of the brain are stimulated upon the delivery of a pulse. Machines are now available which can give up to 50 stimuli per second (rapid-rate TMS, or rTMS). Michael and Erfurth (2004) tested the effects of TMS with nine bipolar I in-patients diagnosed with mania in an open and prospective study. Eight of the patients received TMS as add-on-treatment to an insufficient or only partially effective pharmacological therapy. Both TMS monotherapy and add-on-treatment with TMS sustained reduction of manic symptoms and were reported to be safe treatment strategies with little subjective side effects. Although a few studies have shown such results, TMS is still not a frontline treatment for mania. More research is needed to decipher the long-term effects of TMS.

The treatment literature for bipolar disorder and specifically mania is vast. This section covered most of the common methods of treatment for mania in the general population. The next focus of the paper will be on bipolar disorder in individuals with ID.

Bipolar Disorder in Individuals with Intellectual Disabilities

In recent years, research on bipolar disorder in individuals with ID has been picking up speed. Much of the literature has centered on what the characteristics of this disorder are in this population (particularly in those who are non-verbal), as well as the pharmacological treatment available for these individuals. Although there is a greater void in bipolar research in this population versus in the general population, more questions are being answered with each passing year. This next section will describe the history, characteristics, prevalence, assessment, and treatment of bipolar disorder as it pertains to those with ID.

History

Much like the history of dual diagnosis, the history of bipolar disorder in individuals with ID has been debated over for decades. The very question of whether bipolar disorder in these individuals actually occurs has recently been answered with a resounding and nearly universal yes (Ruedrich, 1993a). However, there remains debate on how bipolar disorder is manifested in individuals functioning in the severe or profound levels of ID, as well as what the best way to assess for this disorder is in these individuals.

The visual display of quantitative data regarding the severity of mood symptoms in bipolar disorder has a rich history, going back to the detailed “life charts” presented by Kraepelin in his classic textbook, *Manic Depressive Insanity and Paranoia* (Pfadt, Korosh & Wolfson, 2003). Much of this history has been described earlier in previous sections, therefore the next section will discuss the characteristics that differentiate bipolar disorder in individuals with ID.

Characteristics

Bipolar disorder has not been well recognized in individuals with severe to profound levels of ID (Cain et al. 2003). This is largely due to limitations in communication, and the

ability to readily express feelings and thoughts. While the DSM-IV-TR does contain items that do not require vast insight by the individual in terms of feelings and emotions (i.e., distractibility, excessive involvement in pleasurable activities, decreased need for sleep), there are still some criteria that are not always easy to apply to individuals who are not capable of communicating to others. For this reason, Sovner (1990) proposed behavioral equivalents of the DSM-III criteria for diagnosing depression and mania in individuals with ID. Similarly, in 2003, Cain and his colleagues assessed for behavioral equivalents of the DSM-IV-TR criteria for diagnosing depression and mania in these individuals. In general, they found individuals with a clinical diagnosis of bipolar disorder and severe communication deficits could be recognized and readily distinguished by mood, behavior, and functional impairment. Specifically, these individuals seemed to have greater incidences of aggression, defiance, non-compliance, SIB, impulsivity, manipulative behavior, attention seeking behavior, teasing, and intrusive behavior (Cain et al. 2003). Additionally, they found the DSM-IV-TR is still useful in discriminating between individuals with bipolar disorder and individuals without. Cain and colleagues (2003) suggest rather than modifying the criteria that do not directly apply to individuals with severe to profound ID, it may just take longer to assess individuals with a dual diagnosis.

Other studies have supported the assertion that there are behavioral equivalents of mania (e.g., McCracken & Diamond, 1988; Steingard & Beiderman, 1987). For example, Vanstraelen and Tyrer (1999) conducted a systematic literature review of rapid cycling bipolar affective disorders in individuals with ID using Psychlit and Medline. The most commonly reported symptoms were observable behaviors such as episodes of mania, insomnia, hypersomnia, increased activity, pressure of speech, agitation, withdrawal and hyperactivity. More recently, Sturmey and colleagues (2004) assessed 693 adults, most with severe or profound ID, and found

the following behaviors were associated with mania: a decreased need for sleep, restlessness, agitation, and irritability.

Although the literature has reported possible behavioral manifestations of mania, it is limited by the use of small sample sizes, studies that have included a large proportion of individuals with borderline through moderate ID, and individual case studies that are not easily generalized to others. Additionally, clinicians are cautioned the associations between challenging behaviors and psychiatric disorders are not by themselves sufficient evidence to use these behavioral equivalents as evidence of a psychiatric diagnosis at this time (Sturmey et al., 2004).

Prevalence

The prevalence rate of bipolar disorder in those with ID is thought to be higher than in the general population (Borthwick-Duffy, 1994). Corbett, in 1979, reported a 1.5 % prevalence of bipolar disorder among 402 residents with varying levels of ID. Göstatson (1985) found no one with a bipolar illness in a sample of 122 individuals in a Swedish country, but reported 1.6% had cyclothymic disorder. Lund (1985) reported 1% of developmentally disabled residents of a Danish country had bipolar disorder. However, in studies that report prevalence rates, it is important to investigate the diagnostic criteria used to determine the presence of a mental illness. For the first study mentioned, Corbett used the criteria from the eighth edition of the World Health Organization (WHO), *International Classification of Diseases* (ICD-8). In the latter two studies, the researchers used the *American Psychiatric Association Diagnostic and Statistical Manual* (DSM-III). Similarly, prevalence rates can be biased due to the clinician's interpretation of various symptoms, as well as the characteristics of the sample (i.e., level of ID). In other studies where researchers have studied individuals with ID in inpatient settings, estimates have also varied. For example, Reid (1972) reported a 1.2 % prevalence rate of bipolar disorder

among 500 patients at an English hospital. Heaton-Ward (1977) noted a 2.0 % prevalence rate among four English hospitals.

Unfortunately, there have not been very many recent studies that report prevalence estimates. One of the few is a study by Kirkpatrick-Sanchez and colleagues (1996) that compared rates of psychopathology in 783 individuals with severe and profound ID. They found 1.6% of the severe individuals between the ages of 41-50 and 3.9% of the severe individuals over the age of 50 had a diagnosis of bipolar disorder. They also reported none of the individuals with profound ID were diagnosed with bipolar disorder. The criteria for diagnosis used in this study were based on the DSM-III-R system and had been made by each facility's psychiatrist or unit physicians and reviewed by other interdisciplinary team members. One point made by the authors was that standardized rating scales were not used to help support the given diagnoses, perhaps leading to under or over diagnosing by physicians. Another study done by Craddock and Owens (1994) estimated on the basis of a meta-analysis of several studies that the rate of bipolar disorder for persons with ID was 1.6%. Finally, a more recent study reported the prevalence rate of bipolar disorder in individuals with ID to be 2.7% (Pary, Strauss & White, 1996). Clearly, prevalence estimates still vary largely depending on the diagnostic method. This supports the need for more research in the area of diagnosis and assessment of bipolar disorder.

Assessment

As seen by the varying prevalence rates of bipolar disorder, as well as the multiple reports on how its manifested in those with severe to profound levels of ID, the assessment of bipolar disorder is not a clear process. Some accounts indicate a greater emphasis on irritability rather than on elevation or infectious euphoria; on changes in behavior, particularly in the level of activity and sleep pattern; on somatic symptoms; and on the loss of developmental skills such

as continence (Berney & Jones, 1988). Other clinicians offer a more broad way of approaching assessment in this population. Specifically, Ruedrich (1993a) proposed three major systems of assessment: direct applications of current system, extrapolated diagnostic systems, and novel diagnostic systems. These three systems will be discussed next:

Direct Applications of Current System. The direct application of the current system (usually referring to the DSM-IV-TR) is a process often overlooked when diagnosing an individual. This is often due to the fact that strictly applying the current diagnostic system to individuals with severe to profound levels of ID is often impossible. Reiss and Szyszko (1983) used the term “diagnostic overshadowing” to describe the process of ascribing all symptomatology in an individual with an ID to the developmental disability itself, rather than the presence of psychosis. On the other hand, many clinicians have often focused on single symptoms (e.g., self-injurious behavior) or multiple behavioral problems as signs of the presence of psychopathology (Sovner & Hurley, 1989), thereby possibly incorrectly diagnosing an individual. Sovner (1986) did state that mood disorders should be one area of relatively less diagnostic distortion because the presence of mood disorders has several neurovegetative signs, as well as more specific responses to pharmacological treatments. A number of authors have also highlighted the feasibility of making bipolar diagnoses on “usual clinical grounds” in persons who have a disability in the borderline and mild range, and who have sufficient communicative language with which to describe the largely subjective DSM criteria (Sovner & Hurley, 1983).

Extrapolated Diagnostic Systems. Some researchers and clinicians have attempted to modify the DSM criteria in order for it to include those who cannot communicate adequately (namely those with severe to profound ID). For example, Huckner and colleagues (1979) modified the criteria of mania only slightly; they included a “resentment of restraint” alongside

the more traditional elevated or irritable mood, over-activity, increased libido, pressured speech, flight of ideas, grandiosity, and reduced sleep. Sovner and Hurley (1983) also proposed behavioral equivalents to the DSM-III criteria. For example, the item labeled euphoric/elevated/irritable mood may be manifested as boisterousness or excitement. Similarly, Sovner and Hurley stated that self-injury may be associated with irritability.

Another important note is that individuals may manifest atypical bipolar symptoms such as in those with rapid cycling, mixed states with features of mania and depression appearing simultaneously, and unipolar mania (Ruedrich, 1993a). For example, it is noted that unipolar mania, where an individual exhibits manic symptomatology lasting continuously for several years, is rare in the general population (Keller, 1987), but several authors have noted “chronic” mania in developmentally disabled patients (e.g., Sovner, 1990; Steingard & Biederman, 1987).

Novel Diagnostic Systems. A number of researchers have attempted to develop novel diagnostic systems based loosely on the DSM and other widely accepted criteria. However, other researchers have developed systems that have no intrinsic relationship with any of the current diagnostic systems (Ruedrich, 1993a). Four of these systems have been described in detail previously. These four systems are the PIMRA, the *Reiss Screen for Maladaptive Behavior*, the DASH-II, and the ABC. Please refer to previous sections for more information on these measures.

Two additional novel systems in assessing for bipolar disorder in individuals with ID is a bipolar mood tracking sheet and the *Affective Rating Scale*. The bipolar mood tracking sheet was created to help caregivers recognize the observable indicators of activation and withdrawal in a focus person with ID or another developmental disability which limits their ability to self-report mood symptoms (Pfadt et al., 2003). This measure is relatively new when compared to the other

measures used in the field, and consequently more research is needed to validate this measure.

The Affective Rating Scale (Wieseler, Campbell, Sonis, 1988) has also been used to empirically track cyclic variations in the behavior of individuals with ID and bipolar disorder. However, this scale has primarily been used in case studies and is not a widely known measure. The next and final section will cover treatment of bipolar disorder in individuals with ID.

Treatment

Although there is significantly less attention given to the treatment of bipolar disorder in individuals with ID than those in the general population, there does exist a body of work addressing this issue. Ruedrich (1993b) explains there are five different situations in which treatment needs may differ: (1) the acute treatment of specific depressive episodes in a bipolar individual; (2) the acute treatment of a specific manic episode in a bipolar patient; (3) the acute treatment of mixed symptomatology of mania and depression occurring simultaneously; (4) the long-term or prophylactic treatment of bipolar disorder, with the aim of preventing subsequent mood episodes, which is necessarily for both typical and rapid-cycling forms of bipolar disorder; and, (5) the psychosocial approaches to all of the above, with the goal of ensuring compliance with therapy, enhancing the quality of life, and addressing educational, vocational, social and developmental opportunities. The discussion of each of these areas is beyond the scope of this paper, therefore only the acute treatment of a specific manic episode will be discussed. Specifically, pharmacological, psychosocial and electroconvulsive therapy will be described in greater detail.

Pharmacological Therapy. Mood stabilizers are the treatment of choice if there has been any manic-like behavior of significance (McElroy & Weller, 1997). One of the mainstay pharmacological treatment of mania has been lithium, alone or in combination with neuroleptic

treatment (Ruedrich, 1993b). In a rare non-anecdotal report in this area, Naylor and colleagues (1974) treated fourteen intellectually disabled individuals with bipolar disorder in a double-blind long-term crossover trial of lithium. The authors reported efficacious results in the lithium treatment group more so than in the placebo group. This finding seemed to suggest that lithium was successful in the treatment of acute mania, but less successful in preventing breakthroughs of mood symptomatology (Ruedrich, 1993b). More recently, Arumainayagam and Kumar (1990) presented a woman with mild ID and bipolar disorder whose clearly seasonal mood disturbances were eliminated by lithium treatment, following previous failures with antipsychotics. However, lithium is not as commonly used now as other mood stabilizers. This is primarily due to the many side effects that may occur including neurotoxicity (ataxia, drowsiness, tremor, vomiting, seizures and coma), rare cardiac arrhythmias, hypothyroidism, severe gastrointestinal problems, psoriasis and significant polyuria with incontinence. Also, lithium has been known to cause seizures when given in toxic doses (Pary, 1991).

The other mood stabilizers that are used often now include valproate and carbamazepine, both of which are commonly the first choices for persons with ID and bipolar disorder. Sovner (1989) reported that five cases of bipolar disorder in intellectually disabled adults were managed with valproate. Two patients had chronic mania, two patients had rapid cycling illness, and one patient had a classic bipolar disorder. Four of the five patients had marked responses to valproate and the fifth patient had a moderate response. These results demonstrated the effectiveness of valproate in the treatment of intellectually disabled patients with typical and atypical bipolar disorders. Similarly, carbamazepine was compared to placebo by Reid, Naylor, and Kay (1981) in 12 patients with manic symptoms. Those patients with manic symptoms were found to respond with a decrease in over-activity on the carbamazepine treatment, whereas overactive

patients with no mood abnormalities did not. One can speculate, based on these symptoms, the individuals who responded may have had bipolar disorder although no specific psychiatric diagnoses were given (Ruedrich, 1993b).

Gabapentin is approved as an add-on therapy to augment treatment in cases of partial response. It is a useful alternative in bipolar disorders as an adjunctive mood stabilizer in those unable to tolerate other medications. Carta, Hardoy, Dessi, Hardoy and Carpiello (2001) used gabapentin in ten intellectually disabled individuals with bipolar disorder. Gabapentin was added to the standard therapy and a positive response was observed. Symptoms of anxiety and depression seemed to especially increase. Preliminary trials in the general population suggest gabapentin has efficacy as monotherapy for mood stabilization in patients with treatment-resistant bipolar disorder (Frye et al., 1998).

Mood stabilizers are the treatment of choice among physicians and psychiatrists, but other pharmacological treatments may be used as well. These other medications include antipsychotics such as risperidone and olanzapine. Although all of these drugs can impact the life of the individuals in a positive way, one must also weigh the negative consequences. Drug side effects such as tardive dyskinesia and other Parkinsonian-like movement disorders, which occur after prolonged exposure to some of these drugs, are often irreversible after an extended period of time. Given these concerns, other forms of treatment are discussed below.

Psychosocial Therapy. Many psychosocial therapies can have potential clinical utility in patients who are exhibiting manic symptoms. Cognitive therapy, which posits that mood symptomatology and the consequent behavior are based on misperception and/or cognitive distortions, may be applied to the manic patient with elevated mood and grandiosity (Ruedrich, 1993b). Similarly, social skills training may also be beneficial to those who are experiencing

manic (or at least hypomanic) symptoms (Griffiths, 1990). Some approaches of social skills training would include a demonstration of expected (non-manic) behavior, followed by direct practice (in which the client is observed by the therapist), and finally feedback to the patient regarding the appropriate exercise of self-control (Benson, 1990). Naturally, these types of treatments would be most beneficial to those with mild and moderate deficits because they would be equipped with higher capacities of understanding and insight.

Other more comprehensive approaches to psychosocial treatment would include social support (e.g., frequent contact, opportunities to ventilate and reassurance) and psychoeducational training (e.g., medication compliance, observation for symptom reoccurrence). This is especially important for many individuals who are left to cope with their mental illness without any social supports, knowledge of their problem or coping skills.

Electroconvulsive Therapy. The primary alternative treatment referenced in the literature is electroconvulsive therapy (ECT). ECT involves passing a small electric current across part of the head, causing the brain to have a seizure. Patients are fully anaesthetized so they are completely unaware of the treatment and feel no pain. A muscle-relaxing drug keeps the body still, even though the brain is experiencing a seizure. The convulsion normally lasts for about 30 seconds to 1 minute, and during this time patients are monitored closely. Physicians suggest that chemical changes produced in the brain during the seizure are what make ECT efficacious. Clearly, this treatment represents an important, yet controversial treatment modality for individuals with ID. An increasing body of literature and clinical experience indicates that ECT is efficacious in reducing symptoms associated with psychiatric symptoms in this population, including mania (Aziz, Maixner, DeQuardo, Aldridge & Tandon, 2001). However, the amount of literature on ECT in individuals with ID is still sparse. Specifically, a literature review by

Kessler (2004) revealed 16 case reports that suggest ECT is both effective and safe to use in this population. However, only two of these cases were with patients with bipolar disorder (e.g., Bates & Smeltzer, 1982; Guze, Weinman & Diamond, 1987). Additionally, there are no large-scale studies done to suggest that ECT is a procedure that would benefit everyone. Due to its intrusive nature, it is generally recommended that the use of ECT be reserved as a last line of treatment, after less intrusive ones have failed.

Clearly, the area of bipolar disorder as applied to the general population and the intellectually disabled has been well studied. The following section will explore the much less researched area of feeding and mealtime behaviors in individuals with ID.

Feeding and Mealtime Behaviors

Individuals diagnosed with ID have a higher prevalence of co-morbid disorders and behavior problems than the general population (Borthwick-Duffy, 1994; Matson & Barret, 1993). One area that continues to be a growing concern among clinicians with intellectually disabled clients is feeding and mealtime problems. Although feeding problems are a serious health concern for clients with ID, most of the research on feeding problems has focused on children, primarily without ID. The literature that examines feeding problems among adults with ID is small in quantity, and consists primarily of case studies that use functional based assessments descriptive in nature. This section will expand on the background, prevalence, different types, assessment and treatment of feeding and mealtime problems.

Background

The area of feeding problems in individuals with ID was initially described in 1983. Linscheid (1983) described ten mealtime problems including tantrums, bizarre food habits, multiple food dislikes, food-texture selectivity, delay or difficulty in chewing, sucking, or

swallowing, delay in self feeding, pica, excessive overeating, too little food eaten, and rumination. In 1989, Sisson and Van Hasselt suggested that feeding problems could be divided into four categories: 1) lack of independent skills; 2) disruptive behavior; 3) eating too much or too little; and, 4) selectivity by type or texture. Currently, a wide variety of different disorders, diagnoses, skill deficits, and excess behaviors fall under the rubric of “feeding problems.” These include: (a) failure to thrive (FTT), a term descriptive of children who have trouble gaining weight, often due to serious pediatric ailments (Harnill, Drizd, Johnson, Reed, Roche & Moore, 1979; Heffer & Kelly, 1994; Stickler, 1984); (b) feeding disorder of infancy or early childhood, a formal diagnostic category for children who persistently fail to eat adequately and gain weight; (c) rumination disorder, characterized by repeated regurgitation and re-chewing of food; and, (d) pica, which is the persistent eating of non-nutritional substances (Girolami & Scotti, 2001). Problems such as food refusal have often been associated with infants and children (Johnston, 1993; Parry, 1994; Riordan, Iwata, Finney, Wohl & Stanley, 1984), but these problems are also prevalent among older individuals with ID as well.

To date, the identification of feeding problems among adults with ID has not been systematically formalized. In state hospitals and developmental centers, a nutritional management committee usually consisting of an occupational therapist, a nutritionist, and a physician among others are in charge of identifying feeding problems. In addition to this, staff and caregivers are encouraged to alert physicians when problems occur during mealtimes. Without a formal system for identifying feeding problems, however, prevalence estimates are difficult to ascertain.

Prevalence

Due partly to the lack of a formal identification system for identifying feeding problems, the prevalence estimates for the occurrence of feeding problems vary. Researchers estimate mealtime problems occur among one third of the children with ID (Gouge & Ekvall, 1975; Palmer, Thompson & Linscheid, 1975), but Perske, Clifton, McClean and Stein (1977) have found the more severe the level of ID, the more prevalent the problem. For example, 80% of severely or profoundly intellectually disabled individuals are estimated to have mealtime problems (Perske et al, 1977). Matson, Gardner, Coe, and Sovner, (1991) estimated the prevalence of eating disturbances at 27.5%, among a sample of 506 individuals with ID residing across two state-run facilities. Matson et al., (1991) also found that feeding problems appear to be more prevalent among those with more profound levels of ID.

As prevalence estimates show that feeding problems are relatively more common among the profoundly retarded individuals than the mild and moderate, it becomes increasingly difficult to identify and assess these problems. When patients are non-verbal and unable to describe their symptoms, it becomes the clinician's job to identify the problem through observable behaviors. For example, a client who is feeling nauseous may refuse food or eat only a small portion. In order to determine the best course of treatment, it is necessary for the clinician to be able to observe certain behaviors, identify the association of the problem with its antecedents, and subsequently take the most appropriate form of action that fits the client's needs. For example, if a patient has been on an anti-epileptic for a significant amount of time and suddenly begins ruminating their food (bringing food past his/her airway repeatedly) on a daily basis, it may be rumination resulting from gastro-esophageal reflux disease (GERD). Essentially, the client may not be ruminating for attention, self-stimulation, or escape. Rather, it could be a side effect of

anti-epileptic use. In this case the clinician may want to consider titrating the client's neuroleptics, or eliminating any anti-cholinergic medications. On the other hand, if the individual refuses to eat certain foods (e.g., tomatoes) because it exacerbates their GERD, then the clinician may consider a different intervention to suppress the reflux (i.e. acid-suppressing medication, or modifying the individual's diet). Clearly, differentiating between the different types of feeding problems and their antecedents are a very important step toward finding the most appropriate treatment for an individual.

Different Types of Feeding and Mealtime Problems

There are a wide variety of feeding and mealtime problems that occur in individuals with ID. This section will describe each of the following problems in more detail: pica; rumination; feeding disorder of infancy and early childhood; food selectivity; overweight, obesity and associated behaviors; and feeding skill problems.

Pica. Pica is a feeding disorder characterized by the repeated consumption of inedible objects (APA, 2000). The DSM-IV-TR criteria specify the behavior must be inappropriate to the developmental level, and not part of a culturally sanctioned practice. Pica is a very serious, even life threatening, disorder associated with lead poisoning, intestinal blockage, intestinal perforation, intestinal parasites, encephalitis, failure to thrive, and, in the worst cases, death (Feldman, 1986; Paisey & Whitney, 1989). Some common examples of pica include the ingestion of cigarette butts, paint chips, fecal material, paper, and dirt (Matson & Bamburg, 1999). Additionally, the criteria specify the behavior is part of a persistent pattern occurring for at least one month in duration. The prevalence rates described in various studies range from 25.8% (Danford & Huber, 1982) to approximately 9% (McAlpine & Singh, 1986). Despite some

of these estimates, Lofts and colleagues (1990) believe the incidences of pica continue to be under-identified.

Rumination. Rumination refers to the voluntary, chronic regurgitation of stomach contents into the mouth and, usually, the chewing and re-swallowing of the rumitus in a repeated cycle after each bout of eating (Johnston, 1993). Rumination is a serious condition because it can lead to a number of life threatening consequences. For example, by engaging in rumination, an individual is more likely to aspirate or choke on the rumitus. In addition, by repeatedly regurgitating one's food over an extended period of time, an individual is bringing his/her esophagus into contact with acids from the stomach, which may lead to serious problems like esophageal cancer (Johnston, Greene, Vazin, Winston & Rawal, 1990).

Rumination may be initiated in different ways depending on the individual's physical capabilities, repertoire and skill development. For example, some individuals may stimulate their gag reflexes manually, some may pitch forward sharply to gain the benefits of centrifugal force; and others may make no noticeable or consistent outward movements (Johnston, 1993). Also, the rate at which an individual ruminates is variable depending on a number of factors (Johnston et al., 1990): (1) certain characteristics of the food consumed (i.e., rates of rumination are higher with pureed foods versus regular foods); (2) the quantity of food (i.e., the more food consumed, the less frequent the rumination); (3) the taste of the rumitus (i.e., better tasting food leads to more rumination), although literature is limited; (4) the amount of oropharyngeal stimulation (i.e., the more stimulation, the lower the rates of rumination); and, (5) environmental events (i.e., the more post meal stimuli presented, the lower the rates of rumination).

Previous researchers have reported approximately 6-10% of institutionalized persons with severe or profound ID ruminate regularly (Johnston & Greene, 1992; Rogers, Stratton,

Victor, Kennedy & Andres, 1992; Singh, 1981). However, this rate may be elevated slightly because it is common for individuals to be initially diagnosed with rumination and later found to have gastroesophageal reflux (Singh, 1981). Consequently, it is imperative to rule out general medical conditions or gastrointestinal problems before diagnosing an individual with rumination disorder.

Feeding Disorder of Infancy or Early Childhood. The hallmark feature of Feeding Disorder of Infancy or Early Childhood is the persistent failure to eat adequately, as reflected in the significant failure to gain weight or significant weight loss over at least 1 month (APA, 2000). In these cases, it is imperative a complete medical check up is carried out in order to ensure the disturbance is not due to an associated gastrointestinal or other general medical condition. If an individual continues to refuse food for an extended period of time, they may require the use of invasive feeding tubes, such as naso-gastic or gastronomy tubes (Riordan et al., 1984; Shore & Piazza, 1997). This type of intervention does increase an individual's food intake, however, it can be associated with additional health risks, while failing to aid in the development of appropriate and effective eating behavior (Kuhn & Matson, 2002).

Food Selectivity. The problem of food selectivity has plagued researchers and clinicians for decades. Some individuals who are labeled "picky eaters" experience no serious consequences of their actions, but other's "pickiness" may lead to malnutrition and severe developmental delays. This is known as the problem of food selectivity. Food selectivity is common among children of normal intelligence and among children and adults with ID. Various case studies detailing food selectivity have illustrated a varied pattern of problematic eating behavior. Included in the literature are reports of selectivity specific to food type (Leibowitz & Holcer, 1974; Shore, Babbitt, Williams, Coe & Snyder, 1998), by the temperature of the food, by

foods of a particular texture (Johnson & Babbitt, 1993; Luiselli & Gleason, 1987), by the person who feeds them or is present during the meal, by the location of the meal, or a combination of all of these (Kuhn & Matson, 2002).

Researchers have found various organic and environmental factors help develop and maintain the behavior of food selectivity (Jones, 1982; Riordan, Iwata, Wohl & Finney, 1980). Organic problems include physical obstructions and abnormalities that interfere with food intake. Commonly, individuals with dysphagia (trouble swallowing) may be very selective in the foods they eat due to their discomfort. Environmental factors described in the onset of food selectivity include a lack of opportunities for skill development, and aversive feeding experiences (Siegel, 1982). Following the onset of food selectivity, reinforcement contingencies have been found responsible for the maintenance of problem behavior (Cooper et al., 1995; Jones, 1982; Riordan et al., 1984).

Overweight, Obesity, and Associated Behaviors. Obesity prevalence figures have been found to be higher in those with ID than in the general population (Simila & Niskanen, 1991; Wood, 1994). Obesity prevalence figures were even higher for older, inactive and female adults, for those with mild ID, and for those with Prader-Willi (almost 100% without strict dietary control) and Down's syndrome (25-43%) (Bell & Bhate, 1992; Holland, 1998). Individuals in the overweight (Body Mass Index ≥ 25) and obese (Body Mass Index ≥ 30) ranges of body composition are at an increased risk for numerous health complications (Bray, 1998). Overweight individuals with ID, particularly in the profound and severe groups, may engage in rapid and continuous consumption of food, or excessive food seeking behavior (Mayville & Matson, 2003). However, research in this area is sparse, at best.

Similarly, research in the area of eating disorders in the intellectually disabled population is very limited. Binge eating has been found to be more prevalent in individuals with Prader-Willi syndrome, presumably due to their impaired food satiety response, and hypothalamic and endocrine abnormalities (O'Brien & Whitehouse, 1990). Anorexia nervosa has been reported in individuals with mild to severe ID, including those with Down's and Turner syndrome, autism, phenylketonuria, and epilepsy. Anorexia nervosa in this population is related to: prior dieting; family psychopathology and conflicts; identity, bereavement and sexuality issues; physical, psychiatric and behavioral regression; and increased mortality (Clarke & Yapa, 1991; Hurley & Sovner, 1979).

Feeding Skill Problems. Feeding skill deficits is an area of concern highly prevalent among individuals with ID (Cooper et al., 1995; Kuhn & Matson, 2002; Sisson & Dixon, 1986). The rubric of feeding skill deficits is characterized by the following: (1) an inability (or unwillingness) to bring the food to their mouth; (2) an inability (or unwillingness) to chew on the food once it enters the mouth; and, (3) an inability (or unwillingness) to swallow food/liquid. When an individual is unable to complete many of these tasks over an extended period of time, severe consequences may occur including malnutrition and possibly starvation (Kuhn & Matson, 2002). Similarly, there are many individuals who are able to feed themselves, but who are unable to regulate the pace at which the food is ingested. If these individuals eat too fast (which is often the case), they are at risk of choking or aspirating (an often life threatening behavior characterized by the drawing in of food or drink into the upper respiratory tract). Additionally, if some food particles get lodged into the lung area for an extended period of time, this can lead to pneumonia and other illnesses. Clearly, more research is needed in the area of feeding skills

deficits among individuals with ID, particularly given the alarmingly high rate at which these deficits exist in this population.

Due to the life threatening nature of many of the feeding and mealtime problems discussed previously as well as the high prevalence rate at which they occur, it is a surprise that there is such a void of research in this area. As the next section will show, the need for research also extends to the area of feeding problems assessment.

Assessment of Feeding and Mealtime Problems

As mentioned previously, there is currently no formal identification process for feeding problems, and feeding problems due to the use of anti-epileptics or psychotropic medications may be overlooked or treated inappropriately. However, some rating scales have proven useful for identifying the presence of feeding problems in individuals with ID. Scales such as the *Reiss Screen for Maladaptive Behavior* (Reiss, 1988) and the *Diagnostic Assessment for the Severely Handicapped-II* (DASH II) (Matson et al., 1996) include items that address problems related to weight gain or loss resulting from overeating or insufficient eating. Recently, a new scale has been developed that focuses strictly on common feeding problems in persons with ID. This tool is known as the *Screening Tool of fEeding Problems* (STEP) and allows for the quick and efficient identification of specific feeding and mealtime behavior problems exhibited by individuals with ID (Matson & Kuhn, 2001).

The STEP is a measure developed specifically for the assessment of common feeding problems among those with ID. There are 23 items on the STEP representing five rationally derived categories/subscales of feeding problems. These include: (1) aspiration risk; (2) selectivity; (3) skills; (4) food refusal related behavior problems; and, (5) nutrition related behavior problems. These questions are designed in a Likert-type format, with three possible

responses for both frequency and severity of the target behavior in the last month: (0) = never occurs, (1) = occurs between 1 and 10 times, (2) = occurs more than 10 times, for frequency ratings; and, (0) = causes no harm or problems, (1) = causes minimal harm or problems, and, (2) = causes serious injury or problems, for severity ratings (Matson & Kuhn, 2001). The STEP possesses acceptable test-retest ($r = .72, p < .01$) and cross rater reliability ($r = .71, p < .01$). In addition, items on the STEP related to pica and rumination were significantly correlated with DSM-IV-TR diagnoses of rumination and pica (Matson & Kuhn, 2001). To date, the STEP represents the only measure specific to feeding problems in individuals with ID.

Once a feeding problem(s) has been identified using observation methods as well as the tools described above, an interdisciplinary team for evaluation is essential to completely assess the problem. An assessment such as this may incorporate input from a physician, occupational therapist, dietician, and psychologist. With the combined effort of all of these disciplines, the client stands a better chance of having every aspect of possible treatment addressed. The following paragraphs explain how each discipline can contribute toward a successful treatment plan for the individual.

A physician would be imperative for a medical assessment in which the following is assessed: the client's upper gastrointestinal anatomy to ensure the individual can protect his/her airway during swallowing (Babbitt, Coe, Cataldo, Kelly, Stackhouse & Perman, 1994); the mucosal lining of the esophagus, stomach and duodenum which provides information about whether medical conditions exist (i.e., esophagitis, esophageal reflux) (Babbitt et al., 1994); the upper gastro-intestinal tract for evaluating motility (Babbitt et al., 1994); and measuring intra-esophageal pressure which provides information about peristalsis and thus esophageal motility (Patti, Diener, Tamburini, Molena & Way, 2001). The medical information gathered by

physicians may help identify feeding problems that occur due to medical conditions and the client can then be treated specifically for each condition. In addition to this, an occupational therapist plays an important role that contributes toward the well being of the client.

An occupational therapist helps examine the individual's coordination and physical ability to perform various tasks necessary for feeding (O'Brien, Repp, Williams & Christophersen, 1991). The skills evaluated that are necessary for oral feeding include oral pharyngeal reflexes and oral-motor skills that include sucking, swallowing, chewing, and tongue control. Skills evaluated necessary for self-feeding include hand-eye coordination, motor development, and gross reflective movements. All of these skills, once evaluated by the occupational therapist, can identify feeding problems that may be due to an individual's physical inability to perform feeding tasks. In addition to the expertise provided by the physician and occupational therapist is the dietician, whose skills are essential for nutritional knowledge.

A dietician provides valuable information pertaining to feeding problems (O'Brien et al., 1991). For example, just as for normal growing children, eating all the necessary nutrients is important to maintain health in an individual with ID. A dietician is able to evaluate a client's diet and ensure that all the necessary nutrients are consumed. In addition to this, a dietician can assess food allergies or identify when a client may have an inability to digest certain foods. Finally, a dietician can evaluate an individual's weight and recommend a diet that provides the right amount of calories to ensure the client's health. Although there are many feeding problems and mealtime behaviors that may be accounted for by the disciplines mentioned above, it is also important to have a psychologist who can identify environmental variables that contribute to or exacerbate feeding problems.

A psychologist can identify feeding problems that exist due to behavioral issues. For example, if a client does not enjoy mealtime, he/she may become physically aggressive in the dining area. Consequently, he/she may be led out of the dining area and put into a quiet room. Behaviorally, physical aggression during feeding times serves as an escape function for this particular client. A psychologist may conduct an analogue functional assessment to determine what exact function the client's behavior is serving (Iwata et al., 1994). By manipulating the consequence following the feeding problem behavior, the function can be identified and addressed.

Although more systematic research is needed to identify the most appropriate identification system for feeding and mealtime problems, the use of an interdisciplinary team clearly helps provide accurate assessment information. Similarly, the treatment of feeding and mealtime problems is aided by input from a variety of disciplines.

Treatment of Feeding and Mealtime Problems

Literature related to feeding problems has focused primarily on the functional and medical aspects of eating behavior. Studies have shown treatment usually incorporates multiple components including different reinforcement strategies (i.e., contingent attention or tangible reinforcement), non-contingent reinforcement escape extinction, antecedent manipulation, and negative reinforcement techniques (Cooper et al., 1995). These procedures are frequently cited in the treatment of food refusal and food selectivity (Cooper et al., 1995). In addition to these procedures, aversive techniques are sometimes used in the treatment of life-threatening behaviors such as pica and rumination (Gravestock, 2000).

In regards to behavioral treatment for the development of appropriate mealtime behavior (i.e., appropriate utensil use and chewing behavior), instructions, prompts, modeling, manual

guidance, behavioral rehearsal, and contingent attention have all been successfully utilized (Sisson & Dixon, 1986). Behavioral techniques have also been effective in reducing behaviors that interfere with feeding such as mealtime rapid eating (Favell, McGimsey & Jones, 1980), and mealtime sloppiness (Cipani, 1981). There are a variety of treatments for feeding and mealtime problems, and the following section will cover the behavioral treatments for the different types of problems in more detail.

Pica. The most effective clinical management approaches for pica remain unclear (Gravestock, 2000). Functional analyses done on individuals exhibiting pica behavior identified multiple functions, including automatic and social positive. Piazza et al. (1998) found that in order to treat automatically maintained pica, delivering oral stimulation with items that matched the properties of the pica items was efficacious.

Punishment procedures have also been shown to be effective in reducing instances of pica behavior in individuals with ID. For example, Duker and Nielen (1993) implemented a procedure in which a pica item was pressed on an individual's lips for two minutes without allowing her to take a bite. The individual, who was a severely intellectually disabled woman also afflicted with Prader-Willi syndrome, significantly decreased instances of pica behavior, even seven months following treatment.

Rumination. Behavioral procedures can be effective when properly implemented for the treatment of rumination (Conrin, Pennypacker, Johnston & Rast, 1982). The majority of behavioral studies have used punishment procedures (Starin & Fuqua, 1987). For example, researchers investigated the use of noxious tastes to decrease rumination in individuals with intellectual disabilities (e.g., Hogg, 1982; Singh, 1981). Lemon juice and Tabasco pepper sauce were selected as aversive contingencies for tongue thrusting, a precursor to rumination, and a

small amount of either the lemon juice or the pepper sauce was squirted into the individual's mouth for each incident of the pre-ruminative behavior. The researchers clearly demonstrated that pepper sauce was the more effective of the two substances and complete suppression of rumination could be obtained with its use (Singh, 1981).

Overcorrection is another punishment procedure that involves response contingent application. In overcorrection, the participant restores the disturbed environment to an improved state (known as restitution). The participant can also repeatedly practice appropriate forms of responding (known as positive practice) (Azrin & Wesolowski, 1975). With respect to operant vomiting, Azrin and Wesolowski (1975) required their participant to clean up the area affected and change their clothes following an instance of vomiting (restitution). Azrin and Wesolowski (1975) also required their participant to engage in 15 trials in which correct forms of vomiting (e.g., hastening to a sink or toilet and bending over it) were practiced (positive practice). The duration of the overcorrection procedures were time intensive, and designed to discourage future bouts of vomiting. Although this procedure was successful in eliminating the behaviors of vomiting most of the time, this and most studies incorporating overcorrection do not focus on rumination as the target behavior.

Oral hygiene, another punishment procedure that is procedurally similar to overcorrection, is used as well. This approach consists of a verbal reprimand ("No"), two minutes of required teeth brushing with a toothbrush that had been soaked in an oral antiseptic (Listerine), and wiping of the participant's lips with a cloth that had been soaked in the antiseptic. Studies support the efficacy of this procedure in reducing rumination (e.g., Singh, Manning & Angell, 1982), but researchers stress its efficacy relies on consistent, time intensive treatment.

Operant procedures, in which the function of the rumination is assessed and then a treatment tailored to reinforce a more appropriate behavior, are becoming more common in recent literature. Researchers have shown in most institutional settings, the ratio of staff to patients usually assures a general condition of deprivation of attention from the staff (Johnston, 1993). Often, this results in the development of maladaptive behaviors in order to receive more attention from the staff. Common functions of rumination also include escape from tasks and self-stimulation (Johnston et al., 1990). In cases such as these, one can assess the function of the behavior, and then manipulate the environment so as to differentially reinforce incompatible behavior (DRI). Barmann (1980) described a case of a boy who engaged in hand mouthing that served as a precursor to rumination. Upon assessment, researchers stated the vibratory stimulation provided by the hand mouthing served as a reinforcer for the child. By giving the child a more benign means to provide this same vibratory sensation (an oral stimulatory device), the rumination was eliminated by serving the self-stimulatory function in a way that was incompatible for rumination. McKeegan, Estill, and Campbell (1987) also demonstrated the use of the differential reinforcement of other behavior (DRO) for the reduction of rumination in an obese, 23-year-old, severely retarded and autistic male. The researchers gave the participant a simple bead-stringing task 60 seconds after the last piece of food or drink was given. If the participant did not ruminate during a 2-minute interval and was on-task at the end of that interval, he was reinforced with a low caloric edible (i.e., unbuttered, unsalted popcorn) and verbal praise. If ruminative behavior occurred during any 2-minute interval, reinforcement was withheld until the next 2-minute interval of non-ruminative, on task behavior had occurred. McKeegan and colleagues not only demonstrated the efficacy of DRO procedures, but also demonstrated by simply extending meal times by giving normal amounts of food in small bites,

ruminative rates could be reduced, thereby supporting a self-stimulatory hypothesis of behavioral function.

Feeding Disorder of Infancy or Early Childhood. Treatment of disorders that involve food refusal or failure to thrive are one of the most commonly researched in this population, as well as in children of the general population. Often, treatment of food refusal must be tailored specifically to the individual. For example, Girolami and Scotti (2001) used an analogue functional analysis in assessing the function of food refusal in three children who exhibited speech and motor delays. After assessing the function maintained the behavior, they posited that by tailoring the treatment to specifically target that function, subsequent food refusal would be significantly decreased. Other studies have supported this theory (i.e., Hoch, Babbitt, Coe, Krell & Hackbert, 1994; Iwata, Riordan, Wohl & Finney, 1982).

Some studies have proven the efficacy of behavioral treatments in decreasing instances of food refusal. Kahng, Tarbox and Wilke (2001) examined the use of a multi-component treatment for food refusal exhibited by a 5-year-old boy who had been diagnosed with mild to moderate ID. Treatment consisted of access to highly preferred tangible items, which were removed contingent on problem behavior or not accepting a bite, and differential reinforcement of alternative behavior. The treatment was efficacious in increasing food acceptance to 100% of bite offers and near-zero rates of problem behavior.

Kerwin, Ahearn, Eicher and Burd (1995) demonstrated the efficacy of systematic non-removal of a spoon and physical guidance for the treatment of food refusal in children without ID. Specifically, each trial began with a verbal prompt (i.e., “open”) delivered simultaneously with the presentation of the spoon to the center of the child’s lower lip. The spoon remained at the lower lip for 5 seconds or until the spoon was accepted, whichever came first. Differential

reinforcement of an incompatible behavior (DRI) was used. Acceptance resulted in praise and access to toys for the remainder of the intertribal interval. Refusal resulted in the removal of the spoon, and no attention for the remainder of the intertribal interval (Kerwin et al., 1995).

In 2001, Ahearn and colleagues again compared physical guidance and non-removal of the spoon in the treatment of food refusal. Across 2 participants, both interventions were effective in increasing bite acceptances. Corollary behaviors (disruption and negative vocalization) both remained the same or increased from baseline during the initial sessions of treatment.

Food Selectivity. Due to the fact that food selectivity by type or texture is a frequently encountered problem, particularly in children with ID (Riordan et al., 1980), various treatments have been developed. For example, Riordan and colleagues (1980) showed by systematically increasing the number of bites of non-preferred food accepted and swallowed contingent on the delivery of preferred foods, this was effective in decreasing the food selectivity of two children with multiple handicaps. Luiselli and Gleason (1987) used sensory reinforcement and texture fading to increase consumption to age appropriate volume and texture for a 4-year old boy with hearing and visual impairments. Specifically, this procedure consisted of presenting light and rocking motion contingent on consuming bites of food and gradually increasing the food texture across meals.

More recent studies have shown the effectiveness of other behavioral interventions for the treatment of food selectivity. In 1996, for example, Kern and Marder used two treatments in a multi-element design to successfully treat food selectivity. The first method, delayed reinforcement, involved presenting a preferred food contingent on the acceptance of a non-preferred food. The second method was when the preferred food was presented simultaneously

with the non-preferred food. A more rapid and sustained increase in the acceptance of non-preferred foods was observed using the simultaneous presentation method (Kern & Marder, 1996).

Stimulus fading has also been used to treat texture selectivity. Shore, Babbitt, Williams, Coe, and Snyder (1998) slowly and systematically changed the properties of a stimulus (e.g., pureed beef) by altering the stimulus across some dimension (e.g., adding some ground beef) until the stimulus approximated a 'goal stimulus' (e.g., hamburger). In addition, food acceptance and swallowing were reinforced, while food refusal and food expulsion were placed on extinction. By systematically fading the consistency of the foods while probing bites at more dense textures, texture selectivity was successfully treated across all 4 participants in the study (Shore et al., 1998). For similar cases, it is important to have a full medical checkup for the individual in order to ensure that the texture selectivity is not due to a physiological cause (e.g., having trouble swallowing). If this is the case, an occupational therapist or physician should closely monitor the stimulus fading procedure.

Overweight, Obesity and Associated Behaviors. Treatment issues regarding obesity and associated behaviors have not been researched much at all in this population. However, researchers have studied a few associated behaviors such as food stealing. Specifically, Maglieri, DeLeon, Rodriguez-Catter and Sevin (2000) used a stimulus control procedure in conjunction with verb reprimands to reduce covert food stealing in an adolescent with moderate ID and Prader-Willi syndrome. After establishing a verbal reprimand as a punisher for food stealing, the researchers paired the reprimand with orange stickers that were then placed on food containers. This resulted in the elimination of food stealing for the participant, as well as adequate maintenance of this gain throughout follow-up.

Other behaviors related to obesity have been noted in this population such as continuous food consumption and excessive food seeking behavior. However, research related to these behaviors is very scarce, and leaves more questions than answers.

Feeding Skill Problems. For individuals with feeding skill problems, there are behavioral management strategies that have been well researched and utilized. For example, Piazza, Anderson and Fisher (1993) used a three-step guided compliance (least-to-most prompting), and social reinforcement contingent on completing a component of self-feeding (e.g., placing the spoon in the mouth) following a verbal or gestural prompt, to successfully teach individuals to scoop and place food in their mouths.

Some individuals with feeding skill problems may have trouble swallowing. Hoch, Babbitt, Coe, Duncan and Trusty (1995) conducted a study in which they taught a swallowing response to a severely intellectually disabled girl who was receiving her meals via a naso-gastric tube. Initially, the participant was taught to accept a bite of food into her mouth using both positive and negative reinforcement. The positive reinforcement was praise and access to tangibles, while the negative reinforcement was meal termination following accepted food. To assist in swallowing, a rubber oral stimulator was placed on the posterior portion of her tongue, and a swallow was elicited by depressing the stimulator as it was brought forward on the girl's tongue (Kuhn & Matson, 2002). This procedure eventually was effective in increasing the amount of food consumed by mouth to an eventual 100%, and decreasing food expulsion and negative vocalizations (Hoch et al., 1995).

Another study done by Shore and colleagues (1999) showed by systematically manipulating the amount of food an individual could consume per bite and the rate at which he consumed the bite, the researchers were able to effectively decrease the individual's "rapid

eating” problem (which was deemed life threatening due to his narrow esophagus). Additionally, the researchers were able to get the same individual to increase the number of times he chewed his food (per bite) using a differential reinforcement procedure.

All in all, the behavioral treatment of feeding and mealtime problems is vast and varies in its efficacy. Much of the research in this area stresses the need for consistency in the application of the treatment. Maintenance and generalization also appear to be strongly correlated with parental/staff compliance with treatment. Although researchers have begun the task of identifying and demonstrating effective treatments for feeding problems, much remains to be done.

RATIONALE

The area of mood disorders has become the focus of recent research in the field of intellectual disabilities (ID). Specifically, researchers and clinicians have taken an interest in bipolar disorder, and how disturbances in mood affect the lives of individuals with ID. Feeding problems in individuals with ID is another area of research that is also growing. Primarily due to the high prevalence rate of life threatening feeding problems among these individuals, clinicians in the field are looking for research that may influence the way in which feeding problems are conceptualized, assessed, and treated. The results of a recent study on individuals with ID suggest feeding problems may vary across diagnostic categorization (Mayville & Matson, 2003), and a need to further assess the relationship between feeding problems and other forms of psychopathology appears warranted.

The rationale behind the present study is to investigate differences in feeding problems across individuals with and without symptoms of mania. To date, much of the literature on feeding problems has focused on functional relations and has excluded the role of psychopathology as a potential etiological factor. This study serves as an exploratory study that may have important implications toward the care of individuals with ID. The information obtained in this study may be useful to researchers and clinicians who seek a greater understanding of the challenges presented by manic individuals as they pertain to feeding behaviors among those in the more severe end of the ID spectrum.

METHOD

Participants

All participants resided at the Pinecrest Developmental Center (PDC) in Pineville, Louisiana. PDC is a state-run facility that consists of individual homes under 24-hour supervision. Approximately 550 individuals are housed at the PDC. The gender, race, and level of ID vary throughout the center. Participants included both males ($n = 27$) and females ($n = 27$) diagnosed with mild ($n = 1$), moderate ($n = 2$), severe ($n = 3$) and profound ($n = 48$) intellectual disability. The majority of the participants were Caucasian ($n = 52$), but a small sample was African American ($n = 2$). See Table 1 for a complete listing of demographic characteristics for the entire sample.

Three groups of participants were included in the present study. All participants were diagnosed with either mild, moderate, severe, or profound ID by an on-site licensed psychologist or psychiatrist using DSM-IV-TR criteria (i.e., scores on measures of both intellectual and adaptive functioning fall more than two standard deviations below the mean). Approval from the Institutional Review Board (IRB) was obtained. Demographic characteristics of each group are presented in Table 2.

Additionally, any individuals who were on a g-tube (feeding tube) at the time of the study were dropped from the study, since being on a g-tube hindered their ability to control their food intake. Similarly, the 4 participants receiving lithium treatment were dropped from the study, since the numerous side effects of lithium are most highly correlated with weight change (Goldberg, 2004). Finally, an attempt was made to match participants across diagnostic groups for gender, age (within 10 years), level of ID and race to prevent confounding effects

Table 1

Demographic Characteristics of Participants (N = 54)

<i>Characteristic</i>	<i>n</i>	<i>%</i>
Age at time of survey (years)		
0-21	0	0
22-45	9	16.67
46-65	42	77.78
66+	3	5.56
Gender		
Female	27	49.10
Male	27	49.10
Race		
Caucasian	52	94.50
African American	2	3.60
Level of Mental Retardation		
Mild	1	1.80
Moderate	2	3.60
Severe	3	5.50
Profound	48	87.30

these variables might introduce. Post hoc analyses showed there were no significant differences between the three groups on blindness, deafness, verbal ability (verbal or non-verbal), ability to ambulate, and presence of a seizure disorder. However, a significant difference was found in medication usage among the three groups, $F(2, 51) = 62, p = .00$. With Tukey's

Table 2

Demographic Characteristics of Groups (N = 54)

Characteristic	%		
	Manic (n = 18)	Psychiatrically Impaired (n = 18)	Control (n = 18)
Age			
0-21	0	0	0
22-45	16.67	16.67	16.67
46-65	77.78	77.78	77.78
66+	5.56	5.56	5.56
Gender			
Female	50.0	50.0	50.0
Male	50.0	50.0	50.0
Race			
Caucasian	94.40	100.0	94.40
African American	5.60	0.00	5.60
Level of Mental Retardation			
Mild	5.60	0.00	0.00
Moderate	0.00	5.60	5.60
Severe	5.60	5.60	5.60
Profound	88.90	88.90	88.90

post hoc analyses, significantly more individuals in the manic group were taking medications than both the non-manic psychiatrically impaired group ($p = .00$) and the controls ($p = .00$).

However, the difference in amount of medication taken between the non-manic psychiatrically

impaired group and the control group was non-significant ($p = .81$). Table 3 shows the frequency of medication usage among the three groups.

The first group of participants met the following five criteria: (1) had at least one clinically significant elevation on the mania subscale of the *Diagnostic Assessment for the Severely Handicapped-Revised* (DASH-II) in the last year; (2) had a clinically significant elevation on the DASH-II mania subscale at the time of evaluation; (3) had a score of 9 or above on the *Young Mania Rating Scale* (YMRS): *Parent Version* (P-YMRS) at the time of evaluation;¹ (4) was off task for at least 70% of a 10 minute observation period in which the participant was given an activity to engage in; and, (5) was identified by a licensed psychologist as being manic at the time of evaluation using a DSM-IV mania symptom checklist.

The second group of participants were used to demonstrate that feeding problems with the manic group were due to manic symptoms and not to the presence of other psychopathological symptomatology. Participants met the following four criteria: (1) did not have any clinically significant elevations on the mania subscale of the DASH-II in the last year; (2) did not have a clinically elevated score on the DASH-II mania subscale at the time of evaluation; (3) had a clinically elevated score on at least one subscale of the DASH-II other than the mania subscale at the time of evaluation; and, (4) did not have a score of 9 or above on the P-YMRS at the time of evaluation.

The final group of participants served as controls. These individuals met the following three criteria: (1) did not have any clinically significant elevations on the mania subscale

¹Five of the 11 items of the P-YMRS do not apply to these individuals because the scale was not designed to be used with individuals with ID. For this reason, these five items were dropped, and the cut off score was prorated to 9.

Table 3

Medication Usage of the Groups (N = 54)

Medication Class	Frequency of Usage		
	Manic	Psychiatrically Impaired	Control
	<u>(n = 18)</u>	<u>(n = 18)</u>	<u>(n = 18)</u>
Antidepressant			
Paxil	1	0	0
Prozac	1	0	0
Mood Stabilizer			
Depakote	6	0	0
Tegretol	3	1	0
Neurontin	2	0	0
Antipsychotic			
Risperdal	2	0	0
Haldol	2	0	0
Quetiapine	1	0	0
Zyprexa	5	2	1
Thorazine	2	0	0
Anxiolytic			
Klonopin	1	0	0
Ativan	1	0	0

of the DASH-II in the last year; (2) did not have clinically elevated scores on *any* of the DASH-II subscales at the time of evaluation; and, (3) did not have a score of 9 or above on the P-YMRS at the time of evaluation.

Measures

Diagnostic Assessment for the Severely Handicapped-II (DASH-II)

The DASH-II is an 84-item informant based measure specifically designed for use with those in the severe and profound range of ID (Matson, 1995). The DASH-II was designed to screen for various psychiatric disorders in these individuals. The DASH-II is an indirect assessment measure that should be administered to an informant who works with and/or has known the individual for at least 6 months, since the individual the measure assesses has extreme cognitive and verbal limitations. Clinical DASH-II elevations are depicted by a higher frequency of symptoms than what would be expected for individuals scoring one standard deviation above the mean. This method of screening is intended to over diagnose, thereby possibly including more individuals than that which are truly mentally ill.

Using a Likert-type scale, informants are prompted to respond to questions about the frequency (i.e., how often has this behavior occurred), duration (i.e., how long has this behavior been occurring) and severity (i.e., how serious has this behavior been) of various behaviors over the course of the past two weeks. The items cover 13 subscales that represent the following: 1) Anxiety, 2) Depression, 3) Mania, 4) PDD/Autism, 5) Schizophrenia, 6) Stereotypies, 7) Self-injury, 8) Elimination, 9) Eating, 10) Sleep, 11) Sexual, 12) Organic, and 13) Impulse. The DASH-II has good inter-rater reliability, and the validity of the DASH-II and many of its subscales has been well established. A series of studies support the validity of the Anxiety,

PDD/Autism, Stereotypies, Schizophrenia, Mania and Depression subscales (Bamburg, Cherry, Matson & Penn, 2001; Matson et al., 1996; Matson et al., 1997; Matson, Rush, Hamilton, Anderson, Bamburg & Baglio, 1999; Matson & Smiroldo, 1997; Matson, Smiroldo, Hamilton & Baglio, 1997). Aman and Singh (1986) also found the DASH-II and its subscales correlated with the Aberrant Behavior Checklist, another widely used scale measuring behavioral disturbance in individuals with ID.

DASH-II Mania Subscale

The Mania subscale is one of 13 subscales on the DASH-II. Individual items from the Mania subscale include “is restless or agitated”, “has a decreased need for sleep”, “is cranky or irritable”, “is easily distracted”, “is extremely happy or cheerful for no obvious reason”, “talks loudly” and “talks quickly”. The mania subscale of the DASH-II had an internal consistency of $\alpha = .79$, while item total correlations ranged from .42 to .76 (Matson & Smiroldo, 1997). Removal of any one item from the mania scale did not markedly affect internal consistency. Additionally, individual items on the Mania subscale were significantly correlated ($r = .43$ to $.91$, $p < .04$) with DSM-IV-TR diagnosis, as were total subscale score ($r = .94$, $p < .0001$) (Matson & Smiroldo, 1997).

YMRS

The YMRS is an 11-item rating scale for mania that has been used solely in the general population. Ratings are based on patient self-report, combined with clinician observation. Four of the 11 items are scored from 0-4, the remaining seven are scored from 0-8, based on increasing severity. The authors report acceptable inter-rater reliability for all items ($r = .66-.92$) and total scores ($r = .93$), and acceptable concurrent validity ($r = .71$) with the MSRS (Beigel et al., 1971), global ratings ($r = .88$), and the *Mania Scale* (Pettersson, Fyro & Sedvall, 1973) ($r =$

.89). Items cover the following areas: elevated mood, increased motor activity energy, sexual interest, sleep, irritability, speech (rate and amount), language (thought disorder), content, disruptive-aggressive behavior, appearance and insight. The YMRS has been used extensively for assessing treatment response, especially in clinical trial studies of bipolar disorder and/or mania. It is considered the gold standard for evaluating concurrent validity of bipolar mania with newer scales (Altman, 2004).

Additionally, a parent version of the YMRS has been constructed for informant-based purposes. Given the cognitive and verbal limitations of the individuals in this study, the YMRS: Parent Version (P-YMRS) is better suited for the current purposes. The P-YMRS is an indirect assessment that should be administered to an informant who works with and/or has known the individual for at least 6 months. Internal consistency for this scale is reported to be .75.

Researchers have found this version may be used to derive clinically meaningful information about mood disorders in youths (Gracious, Youngstrom, Findling & Calabrese, 2002). For example, the P-YMRS has been shown to discriminate well between youths with formally diagnosed Axis I diagnoses, including ADHD and unipolar mood disorders (Gracious et al., 2002). Group differences between the bipolar spectrum versus the other diagnoses as a set averaged 10.8 points on the P-YMRS (Cohen $d = 1.71$, using the comparison group's standard deviation, which is more than double the benchmark of $d = .80$ for a "large effect size" for the social sciences) (Cohen, 1988). The classification rates based on the P-YMRS are also comparable with those reported by other investigators using the parent-reported Child Behavior Checklist (CBCL) to discriminate between ADHD and juvenile mania (Gracious et al., 2002). The scoring of the P-YMRS was studied in children and the average scores were approximately 25 for mania and 20 for hypomania. Anything above 13 indicated a potential case of mania or

hypomania for the group that was studied, while anything above 21 was a probable case (Biederman et al., 1995). Although there is no exact explanation as to how specific mania cutoffs for the P-YMRS have been determined, researchers suggests this measure is helpful in making clinically challenging diagnostic distinctions (Gracious et al., 2002).

STEP

The STEP is a 23-item informant-based measure designed to screen for various mealtime behavior problems displayed by individuals with ID. This instrument is an indirect assessment measure that should be administered to an informant who works with and has known the individual's feeding behaviors for at least the past 6 months. Five subscales are derived: 1) Aspiration Risk; 2) Selectivity; 3) Feeding Skills; 4) Refusal Related Behavior Problems; and, 5) Nutrition Related Behavior Problems. Using a Likert-type scale, informants are prompted to respond to questions about the frequency (i.e., how often the behavior is occurring) and the severity (i.e., to what degree does this behavior cause problems for the individual and others) of the target behavior in the past month. Test-retest reliability ($r = .71$) and cross-rater reliability ($r = .71$) is acceptable (Matson & Kuhn, 2001). While these reliability coefficients may not be considered good by clinical standards, they are deemed acceptable for research purposes, especially given the many deficits of the population being assessed. In addition, the rumination and pica subscales have demonstrated criterion validity through correlating with DSM-IV-TR diagnoses (Kuhn & Matson, 2002).

Direct Observation Methods. Direct observations of behavior were incorporated into the study to further support the results of the indirect assessments. Specifically, as a validation measure of the mania group, an attempt was made to observe symptoms of mania within individuals. According to Matson and Smiroldo (1997), a hallmark feature of mania in

individuals with ID appears to be “restlessness or agitation”. Consequently, a 10-minute observation was conducted for each individual who met the criteria for mania according to the indirect assessments administered. The observation period was conducted during the individual’s day program, at which time the individual was instructed to sit and engage in an activity they would normally participate in (e.g., puzzles, coloring, etc). A continuous time sampling procedure was conducted to calculate the percent of time the individual was on task versus the percent of time the individual was not on task for that ten-minute period. Off task behavior was defined by the participant fulfilling the following two criteria: (1) not participating in the task; and, (2) engaging in motor movements other than what is required to complete the task. If the individual was off task for at least 70% of the time period, they remained in the manic group.

In order to validate the results of the STEP with direct observations, an attempt was also made to observe feeding and mealtime behavior problems during mealtimes or in other situations where these problems were reported to be apparent. Within a week following the administration of the STEP, a direct observation for each individual was conducted to validate the occurrence of any feeding problems. During the direct observation period, a blank STEP was completed by the experimenter based on behavioral observation alone. The same experimenter administered the STEP and did the direct observations. The two observations were done within one week apart for each participant, and all observations were done during the participant’s lunch period. The experimenter was blind to the STEP assessment results when observing the participants. The total number of problems indicated during the first observation was compared directly with the total number of problems indicated for the second observation for each participant. Total percentage agreement was then calculated for each item and the average of the agreements was

found. The reliability between the indirect assessment results and the direct observations was assessed.

Procedure

Data was collected from direct care staff working at the Pinecrest Developmental Center (PDC). A masters' level interviewer administered the DASH-II, P-YMRS and STEP for all participants. The interviewer was trained individually on how to administer the measures to the informant, as outlined in the manuals for each measure. Each informant (a direct care staff member) was required to have worked with the participant for at least 6 months and was selected based on their familiarity with the study participant being assessed. All measures were administered within a 2-month period. Additionally, all measures pertaining to a participant were administered to the same informant in order to decrease the chances of inter-rater error between measures. Data collection and storage were conducted in accordance with accepted procedures to secure patient confidentiality (Hipaacomply, 2005).

Finally, after data collection was completed and the three diagnostic groups were determined, a change in bodyweight was also assessed for all participants. Specifically, a bodyweight for each individual was recorded from one point 6 months prior to the study and from one point during data collection. This procedure was used to ensure that certain feeding problems were validated by bodyweight measures. For example, if the participants in the manic group were more likely to engage in behaviors related to food refusal than their counterparts, it is likely that those individuals in the manic group should have a greater decrease in bodyweight than the other two groups. Similarly, if the participants in the manic group were more likely to engage in behaviors related to overeating, it is likely that those individuals should also have a greater increase in bodyweight than the other two groups.

Experimental Design

In an effort to determine the statistical power of the study, an apriori power analysis was conducted. Chase and Tucker (1976) recommended in behavioral sciences with an a priori level of significance (α) of .05, power should be set at .80. Using GPOWER, a power analysis computer program (Erdfelder, Faul & Buchner, 1996), a sample of 128 participants was shown to be optimal to achieve a power of .80, using a medium effect size. The present study had 54 participants, which is by far the largest number of manic ID clients studied to date. While this smaller sample size does serve as a limitation, the study remains important given the general scarcity of research on the topic.

The present study has three groups (manic, non-manic psychiatrically impaired, control) which have been evaluated across five subscales of the STEP using five 3 X 1 univariate ANOVAs. According to Stevens (1996), setting the original alpha level to .10 is considered acceptable in situations where the chances of making a Type II error is of greater consequence than of making a Type I error. Because of the possible life threatening nature of feeding problems, concerns of overlooking any significant results may be of serious consequence (i.e., injury or even death). Therefore, an alpha level of .10 was used. Since the analyses consisted of five multiple comparisons, a Bonferroni correction procedure was utilized to minimize the inflation of alpha error. A Bonferroni correction procedure is a multiple comparison correction used when several dependent or independent statistical tests are being performed simultaneously (Bland & Altman, 1995). Given these considerations, a final alpha level of .02 was used after the Bonferroni correctional procedure was applied.

According to Huberty and Morris (1989), there are four situations when the use of multiple univariate ANOVAs is justified over using a MANOVA. One of the situations is when

the outcome variables are conceptually independent (Biskin, 1980, p. 70). Given the low inter-correlations between the five subscales of the STEP (see Table 4), this point is validated.

Similarly, Huberty and Morris (1989) also stated when the research being conducted is exploratory in nature, the use of multiple univariate ANOVAs is acceptable. This study would be described as exploratory in nature as no previous studies have been done in this area. A third situation in which multiple univariate ANOVAs may be appropriate is when some or all of the outcome variables under current study have been previously studied in univariate contexts (Huberty & Morris, 1989). Independent studies on food refusal, rumination and feeding skills deficits are numerous, thereby again supporting the use of multiple univariate ANOVAs. Finally, there is an evaluation design situation in which multiple univariate analyses might be conducted. This approach is used when some evidence is needed to show that two or more groups of units

Table 4. STEP Subscale Inter-correlations (Mayville and Matson, 2003).

	Aspiration	Selectivity	Refusal	Nutrition	Skills
Aspiration	--	.38	-.02	.25	.09
Selectivity	--	--	.42*	-.06	.20
Refusal	--	--	--	.16	-.01
Nutrition	--	--	--	--	.17
Skills	--	--	--	--	--

*significant at .01 level (2-tailed)

are equivalent with respect to a number of descriptors (Huberty & Morris, 1989). Since the three groups are being compared along a number of variables, this point also seems validated.

RESULTS

Scores derived from the STEP were analyzed across the three diagnostic groups (manic, non-manic psychiatrically impaired, control) using five 3 X 1 univariate ANOVAs. A significant difference was found across the Nutrition Related Behavior Problem subscale $F(2, 51) = 4.4$, $p = .02$. With Tukey's post hoc analyses, a significant difference was found for the Nutrition Related Behavior Problem subscale between the manic and control groups ($p = .02$). However, the difference between the manic and non-manic psychiatrically impaired group was non-significant ($p = .15$), as was the difference between the non-manic psychiatrically impaired group and the control group ($p = .57$). Differences across the Aspiration, Selectivity, Skills, and Refusal Related Behavior Problems subscales were all non-significant. Results are displayed in Table 5.

Table 5

Means, Standard Deviations, and One-Way Analysis of Variance (ANOVA) for Step Subscale Analysis

Variable	<u>Manic</u>		<u>Non-Manic</u>		<u>Control</u>		<u>ANOVA</u>	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>F(2,51)</u>	<u>p</u>
Aspiration	.056	.24	.11	.47	.00	.00	.60	.55
Selectivity	.50	1.10	1.22	1.40	1.44	1.34	2.66	.08
Refusal	.83	1.10	.44	.92	.33	.59	1.55	.22
Nutrition	1.67	.97	.83	1.95	.39	.70	4.35	.02*
Skills	3.67	3.07	2.00	1.91	2.33	1.85	2.55	.09

* $p \leq .02$

In order to further delineate which items of the Nutrition Related Behavior Problem subscale most contributed to the differences between the groups, five 3X1 univariate ANOVAs were done on each of the five items within the subscale. An alpha level of .05 was used. A Bonferroni correctional formula was not used because a .02 alpha level was used for the preliminary analysis. A significant difference was found for item 12 (He/She will continue to eat as long as food is available), $F(2, 51) = 3.98, p = .03$. With Tukey's post hoc analyses, significant differences for item 12 were found between the manic group and both the control group ($p = .05$), and the non-manic psychiatrically impaired group ($p = .05$). The difference between the control group and the non-manic psychiatrically impaired group was non-significant ($p = 1.00$). No significant differences were found for the other four items within the Nutrition Related Behavior Problems subscale. Results are displayed in Table 6.

The next analysis was to calculate the inter-rater reliability of the feeding problems reported by the staff using the STEP with the direct observations made by the experimenter. The reliability between the two methods of assessment was evaluated by calculating the total percentage agreement for each item and then averaging the agreements. An 87% reliability was found between the two assessment methods.

The final analysis was to compare the weight change of the participants in the three groups from 6 months prior to the study to the present date. A one-way ANOVA was used to determine if there were any significant weight changes between the three groups. With the initial weight (weight from 6 months ago) computed as a covariate, there were no significant differences in weight change found between the three groups.

Table 6

Means, Standard Deviations, and One-Way Analysis of Variance (ANOVA) for Selected STEP Items Analysis

Variable	<u>Manic</u>		<u>Non-Manic</u>		<u>Control</u>		<u>ANOVA</u>	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>F(2,51)</u>	<u>p</u>
Steals or attempts to steal food from others during meals	.06	.24	.11	.47	.00	.00	.60	.55
Eats or attempts to eat items that are not food	.11	.47	.11	.47	.00	.00	.50	.61
Only eats a small amount of the food presented	.33	.69	.28	.67	.17	.38	.37	.70
Will continue to eat as long as food is available	.83	.92	.22	.65	.22	.65	3.98	.03*
Steals or attempts to steal food outside of mealtime	.33	.69	.11	.47	.00	.00	2.25	.12

* $p \leq .05$

DISCUSSION

The rationale behind the present study was to investigate differences in feeding problems across individuals with and without symptoms of mania. Given that the sample consisted of a relatively small number of participants in each group, apriori analyses of power were conducted to determine whether possible findings of non-significance may have been related to low power. It was determined a sample of 128 participants would be optimal to achieve a power of .80, using a medium effect size. Although a larger sample size would have been ideal, it was impossible to attain any more participants for this study due to the stringent criteria that differentiated the three groups. Regardless, given the less than optimal sample size as well as the conservative Bonferroni correctional procedure administered to protect against alpha inflation, three of the five subscales of the STEP (i.e., Nutrition Related Behavior Problems, Selectivity, and Feeding Skills) were still either significant or were approaching significance. In addition, from estimates of observed power across individual items, one may conclude a larger sample may have lead to the detection of more significant differences across the groups.

Based on the results of the univariate analyses across STEP subscales, individuals who exhibited manic symptoms were significantly more likely to endorse items on the Nutrition Related Behavior Problems subscale compared to controls. The Nutrition Related Behavior Problems subscale consists of five items that describe behaviors related to over and under-eating, stealing food from others, and attempting to eat items that are not food (pica behavior).

Since the area of mania and feeding problems has not been explored thus far, there is no previous research to support this finding. However, studies on Attention-Deficit/Hyperactivity Disorder (ADHD) have shown that children who exhibit symptoms of restlessness often have difficulty regulating feeding habits (Veroff, 2005) and have higher incidences of pica behavior

(ADHD Resource Center, 2005). Due to the overlap of some symptomatology as manifested in ADHD and mania (i.e., hyperactivity, restlessness, distractibility, etc) (Barkley, 2003), it is plausible there may be an overlap in co-occurring problems as well.

After doing an item analysis to see which items of this particular subscale contributed the most to the significant difference, it was found the item entitled ‘will continue to eat as long as food is available’ was more likely to be endorsed by those who were considered manic. To date, there has not been any research indicating a relationship between mania and appetite. The only research in the field of ID that has looked at a relationship between psychopathology and appetite, have been two studies looking at depression. O’Brien and Whitehouse (1990) found that individuals with symptoms of depression engaged in an increased level of food seeking behavior compared to peers without depressive symptoms. However, Mayville and Matson (2003) found that participants in a depressed group received higher frequency scores than participants in either PDD or no diagnosis groups for the item representative of a decrease in food intake. Explanations for the discrepancy of results between the two studies include a lack of similarity between studies with regard to the ID level of those assessed, a lack of information about the depression diagnostic group in the O’Brien and Whitehouse study, and the exceedingly small number of subjects included in the O’Brien and Whitehouse study (Mayville & Matson, 2003). Having no previous research to rely on, the present study represents the first attempt at establishing a relationship between mania and appetite among those with ID. Given that mania is characterized by an increase in motor activity, it appears logical that a boost in appetite may occur as a result of the individual’s additional energy expenditure.

It is important to note other reasons may have contributed to the reported increase in appetite in the manic group. For example, an analysis done on medication usage showed the

participants in the manic group were taking a greater amount of medications than those in either of the two other groups. Previous research shows many medications used with this population have adverse side effects, some of which have properties related to stomach problems and dental complications (Kerr, 2002). Medications such as benzodiazepines and neuroleptics may cause an interference with swallowing (deglutition) and oesophageal function (Rogers et al., 1992), while other medications may cause weight gain (e.g., Lithium; Goldberg, 2004). These specific side effects may have contributed to the reported boost in appetite of those reported to be manic. Future research should further evaluate this finding by possibly controlling for the type, amount and duration of medication use among the groups.

From the results of the univariate analyses across STEP subscales, it was also found that two other subscales of the STEP were approaching significance. The Selectivity subscale of the STEP was approaching significance with a value of .08. The Selectivity subscale consists of five items related to selectivity for the caregiver who feeds them, the texture of food, the type of food, the temperature of food and the setting for eating. The results showed individuals who were in the manic group engaged in fewer behaviors of food selectivity than those in the control group, although this difference was only approaching significance. Given the implications that individuals who are manic also tend to have a larger appetite, it may also be true that they will eat a greater variety of food than others or compared to periods when they were not manic.

The other subscale approaching significance was the Feeding Skills subscale with a value of .09. This subscale consists of eight items that represent a lack of skills in chewing, swallowing, feeding oneself, pacing oneself while eating, and requiring special equipment or positioning to help eat properly. The results showed individuals in the manic group engaged in more behaviors related to feeding skills problems than those in the non-manic psychiatrically

impaired group, although this difference was only approaching significance. This result is not surprising given that a good portion of the items in the Feeding Skills subscale have to do with an increase in the pace of eating (e.g., ‘eats a large amount of food in a short period of time’, ‘swallowing without chewing sufficiently’). Individuals who are manic tend to exhibit symptoms of restlessness (Matson & Smiroldo, 1997) and it appears logical that this may increase the pace of their food consumption, so as to avoid staying seated for an extended period of time. Consequently, more equipment and proper positioning may be required to encourage the slower consumption of the food. However, it should be noted that the manic group did not differ as much from the control group in this regard. It is also important to keep in mind these results were approaching significance, but they were not significant. Given the small sample size in the present study, it remains to be seen whether a larger sample may have lead to the detection of more significant differences across groups.

With regard to the remaining two subscales of the STEP, differences across the Aspiration Risk and the Refusal Related Behavior Problems subscales were non-significant. The Aspiration Risk subscale only has two items, each of which concern rumination and vomiting. There is no reason to believe that mania would manifest itself in either of these two ways, unless the vomiting is non-voluntary due to an increased amount or pace of eating. The Refusal Related Behavior Problems subscale has three items, which represent leaving or pushing away food before eating, and problem behaviors that lead to escaping food consumption. Given that all significant endorsements for the manic group have dealt with an increase in food consumption, the lack of significance in this area is not surprising. Table 7 illustrates an item analyses for all STEP items.

Table 7

One-Way Analysis of Variance (ANOVA) for All STEP Items

Item	<u>ANOVA</u>	
	<u>F(2,51)</u>	<u>p</u>
He/She regurgitates and re-swallows food	1.00	.38
He/She vomits either during or immediately following meals	1.00	.38
He/She eats only selected types of food (e.g., pudding, rice)	.67	.52
He/She prefers a certain setting for eating (e.g., dining room)	---	---
He/She eats only foods of a certain temperature	---	---
He/She prefers to be fed by a special caregiver or prefers to be fed	.50	.61
He/She eats foods of only certain textures	3.49	.04*
He/She cannot feed him/herself independently	2.25	.12
He/She does not demonstrate the ability to chew	.67	.52
He/She chokes on food	1.00	.38
He/She does not demonstrate the ability to swallow	1.00	.38
He/She requires special equipment for feeding (e.g., G-tubes)	1.20	.31
He/She eats a large amount of food in a short period of time	.17	.84
He/She requires special positioning during feeding	3.40	.04*
He/She swallows without chewing sufficiently	2.62	.08
Problem behaviors (e.g., aggression) increase during meal times	3.75	.03*
He/She spits out their food before swallowing	1.21	.31

(table 7 continued)

He/She pushes food away or attempts to leave the area	.49	.62
He/She steals or attempts to steal food from others	.60	.55
He/She eats or attempts to eat items that are not food	.50	.61
He/She only eats a small amount of the food present to him/her	.37	.70
He/She will continue to eat as long as food is available	3.98	.03*
He/She steals or attempts to steal food outside of mealtime	2.25	.12

* $p \leq .05$

An important concern when using indirect assessment measures is the reliability of the data. Results of indirect assessments can be skewed when the informant is not trained, motivated or competent enough to respond accurately (Lalli, Browder, Mace & Brown, 1993; Sturmey, 1996). Often, scale developers attempt to control for these problems by validating the scales used and by making the questions as clear as possible (Sturmey, 1996). Although all the measures used in the present study were validated, attempts were also made to assess the reliability of the reported endorsements on the dependent measure used in this study. The results of the reliability analysis showed 87% of the items endorsed on the STEP were observed in the natural setting. The items most often not observed were pica, rumination and vomiting, but these behaviors were not reported to occur all the time.

The final analysis done was to compare the weight change of the participants in the three groups from six months prior to the study to the present date. This analysis was done to help validate any findings of food refusal or excessive food consumption among the three groups. The initial bodyweight of all the participants was used as a covariate in order to control for the variability in initial weight. There were no significant differences in weight change in the three

groups across time. Although other findings appear to support the assumption that individuals who exhibit symptoms of mania *will* continue to eat as long as food is available, this does not necessarily mean these individuals had greater food consumption. In institutional settings, a client's weight is often monitored closely by dieticians and physicians, and a large increase in weight may often result in the institution of a dietary restriction. Additionally, the weight change analysis does not take into account other factors such as the individual's metabolism or the type, amount, and duration of medication usage these individuals were adhering to.

Implications and Future Directions for Research

In the field of ID, there is still speculation as to how mania is manifested in individuals with severe and profound deficits because of difficulties in communication, atypical presentation and lack of clear diagnostic criteria (Arumainayagam & Kumar, 1990). Symptoms such as “Inflated self-esteem or grandiosity” and “flight of ideas or subjective experience that thoughts are racing” requires the individual to have significant verbal and cognitive capacity to express these feelings, which is often not observed in these individuals. “More talkative than usual or pressured to keep talking” also relies on the assumption the individual has verbal ability. Although the hallmark feature of mania in these individuals appears to be restlessness and/or agitation (Matson & Smiroldo, 1997), there are still no clear diagnostic criteria to aid clinicians in making a diagnosis. Furthermore, there is no indication as to what specific skill areas are affected by manic behavior. This study represents the first that may indicate a relationship between appetite and mania, which ultimately may be helpful in diagnosing this disorder in individuals with severe verbal deficits.

There are several potential implications of this study. According to the results of this study, it appears that individuals who exhibit symptoms of mania will be more likely to eat as

long as food is available to them. If an increase in appetite is found to be a characteristic of manic behavior in individuals with ID, then this can further simplify the identification and assessment of mania in these individuals. Along the same lines, it is also possible a diagnosis of mania may be useful for identifying symptoms of feeding problems among those with ID. However, before firm conclusions can be drawn, future studies must address the type, amount and duration of medication usage to eliminate any confounding effects these variables may have on appetite.

Another implication of this study is that a deficit in feeding skills may be characteristic of those individuals who were exhibiting symptoms of mania. While this difference was not statistically significant (i.e., .09), it appears to be approaching significance and a larger sample size may have further differentiated among the three groups. Furthermore, if a deficit in feeding skills is truly characteristic of individuals with mania, the implications of this has great treatment utility. Feeding skills can be taught and reinforced for these individuals, and this may further decrease chances of choking or aspiration, which occurs often in lower functioning individuals with ID. A deficit in feeding skills can also include a difficulty in swallowing and studies that teach individuals with ID to swallow have been found to be successful (Hoch, Babbitt, Coe, Duncan & Trusty, 1995). Future studies should further examine the possible relationship between mania and feeding skills with a larger sample of individuals.

In summary, this study represents the first to examine the relationship of mania and feeding problems among individuals with ID. The information obtained in this study may be useful to researchers and clinicians alike who seek a greater understanding of manic behavior and what areas of functioning this behavior may affect. From previous studies indicating differences across diagnostic groups for items indicative of appetite disturbance (e.g., Mayville

& Matson, 2003), it may be inferred that disordered feeding behavior varies according to diagnostic classification. From the present study, it more specifically infers a disturbance in appetite may be more likely to accompany psychiatric disorders characterized by mania. Future research must attempt to address some of the limitations described in this study in order to make firmer conclusions on the relationship between mania and feeding/mealtime behavior problems among individuals with ID.

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